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## ON RAPID FILTRATION.

BY E. C. H. HILDEBRAND.

Though much has been said and written on this subject, still it does not seem to be exhausted yet, not long ago new suggestions having been made in that direction. Viewing this matter from a practical standpoint, it appears to me that we should not aim so much at the utmost gain of time in filtering and washing out precipitates, but rather at a more uniform good result of these operations. In accordance with this view, the following described apparatus will be found both convenient and effective enough to shorten the filtering process, and the drying of the filter and its contents quite considerably.

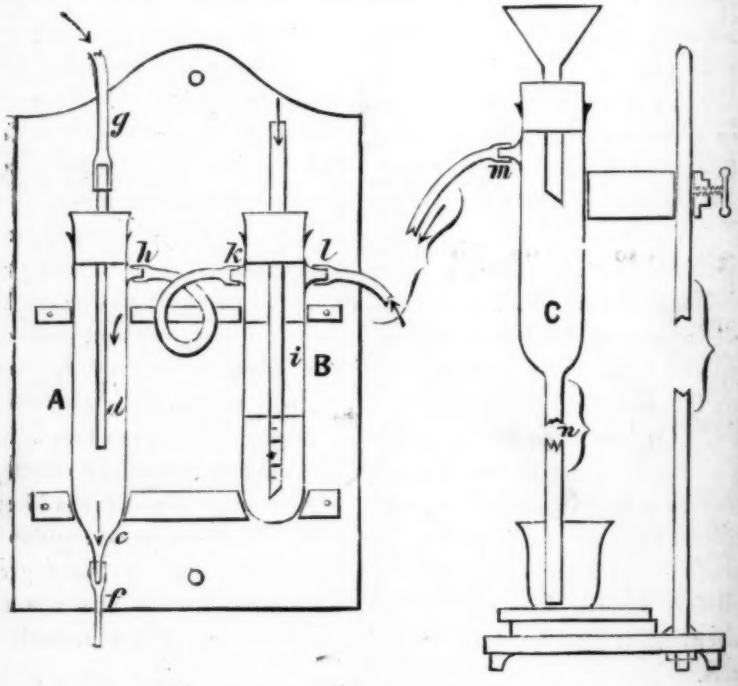
It is composed of *Weil's* filtering tube, and *Scheibler's* drop aspirator, to which I have added a vacuum regulator. The filtering tube (recommended by *Weil* about 16 or 18 years ago) allows to filter under a pressure of 1 to 2 feet of water column, without any other support of the filter exeept the funnel itself. It allows, further, to filter into any kind of receptacle, which will be found a great convenience. On the other hand, Scheibler's drop aspirator, used as a filtering pump, is by far the most perfect one in reference to the effect produced by a given quantity of water, while its absolute effect is likewise very satisfactory for filtering purposes. The vacuum regulator is intended to prevent the rarefaction of air surpassing a certain degree.

Before entering into a more detailed description of the whole arrangement, it may be well to make a few remarks about funnels and filters.

It has been laid down as a rule, that the sides of a funnel should have an angle of inclination of 60 degrees, in which case a filter, folded at right angles, will fit exactly into the funnel. I found that a filter adjusted into a funnel of a more acute angle offers remarkably greater security against breaking, provided, of course, the body of the

funnel approaches as nearly a perfect cone as possible. In this case the transition of the cone into the tube is marked by a distinct angle, formed by the meeting of two straight lines. The opening at the bottom of the funnel must not be too large, its diameter should not surpass $\frac{1}{4}$ inch.

A filter inserted into a funnel of 50 degrees, moistened and brought in perfect contact with the glass by pressing with the finger, will stand the pressure of a column of water $1\frac{1}{2}$ feet high with safety. Filters supported by funnels of 30 degrees did not rupture by the weight of a column of water 3 feet high. Funnels over 50 degrees require the introduction of another but smaller paper filter, inside of which, and over-reaching it, the main filter is inserted.




1. *The filtering tube* (see sketch C) consists of a wider upper part, carrying the funnel, and a lower narrower part, reaching almost to the bottom of the receptacle, and dipping into the filtered liquid. By rarefaction of the air in C, the filtered liquid is raised to a certain height, and therefrom results an increased pressure on the liquid in the funnel,

and an accelerated filtration. The total length of the tube is 20 inches, width of the upper part $1\frac{1}{4}$ inches, its length 6 inches. The narrow side tube *m*, is 1 inch below the rim of C. Internal diameter of lower part $\frac{5}{16}$ inch, its length 14 inches. The lower part must be wide enough to allow air bubbles to rise or overcome the capillary attraction exerted by the sides of the tube upon the liquid. The tube is closed by a perforated India rubber cork, receiving the neck of the funnel, the opening of which reaches 1 or 2 inches below the little side tube *m*. The whole is held in position by a retort-stand, burette-holder or the like.

2. *The aspirator* A. Upper part 1 inch in diameter and 6 inches long, the bottom forming a cone, connecting it with the lower part *e*, which has $\frac{1}{8}$ inch internal diameter, and is 1 or more inches long. To this we attach a rubber tube *f*, 5 or more feet long, and of the same internal diameter of $\frac{1}{8}$ inch. The narrow side-tube *h* is 1 inch below the top of A. A perforated rubber cork, provided with a glass tube *d*, is inserted, as seen in the sketch. This tube has $\frac{3}{16}$ inch internal diameter, extends downward about 3 inches, upward 1 or 2 inches. To this upper end a rubber tube *g* is attached, destined to supply the water for the aspirator, from an elevated vessel. If the flow of the water is so regulated (by means of a faucet or pinchcock) that it leaves tube *d* drop by drop, these drops falling into the narrow tube *e*, and its continuation *f*, perpendicularly beneath it, and, filling out its entire width, act the part of the piston in a pump, as, by their motion downwards, they carry with them the air enclosed in the tube between the single drops. In this way the air in A, as well as in any vessel connected with it by the communication tube *h*, is rarefied. The aspirator—equal lengths of time taken into consideration—draws less air if the drops follow each other slower, but then a higher effect is produced by a certain quantity of water, whilst if the drops fall quicker, the apparatus draws more air in that time, but the effect of the same quantity of water is diminished. Thus, 1 volume of water draws from 10 to 25 times its volume of air.

3. *The vacuum regulator* B. After several experiments, I found a mercury valve of the construction shown in sketch B, working as well as could be wished. B has $1\frac{1}{8}$ inch or more internal diameter and is about 6 inches long. The narrow side tubes *k* and *l* are opposite each other, and 1 inch below the rim. A good soft cork, free from holes,

is selected and perforated for the reception of tube *i*. The latter has about $\frac{3}{16}$ inch internal diameter by 9 inches in length. Its lower end is cut off obliquely and provided with marks showing $\frac{1}{8}$ inches, and beginning at the obtuse angle of the oblique cut. Tube B is filled up with mercury to a height of about 2 inches, then 2 inches of water are given on the top of this. The working of this valve is easily understood. By moving tube *i*, downwards or upwards, its lower end is, to a larger or smaller extent, immersed in the quicksilver, and if suction is applied to one of the side tubes, the other being connected with a closed vessel, the rarefaction of air in B, and in the vessel connected with it, will reach a certain maximum degree, beyond which it cannot go; air entering by way of tube *i*, and penetrating the mercury, it maintains that status in the apparatus to which the valve has been adjusted. If the end of tube *i* is cut off obliquely, as directed, the passage of the air through the quicksilver goes on more quiet, not so eruption-like, and the supernatant water prevents entirely the spattering of the metal. Several physical causes unite to give the graduation on tube *i* only an empirical value. Under the circumstances named, $\frac{3}{4}$ inch immersion of tube *i* will create in C a water-column of about 15 inches height.

4. *The connection* of the single parts is effected by rubber tubing, which need not be of the heaviest kind, as it is not exposed to any high external pressure. Aspirator and mercury valve are best mounted on a board (as seen in the sketch) and hung in a proper place on the wall, within reach of the hand.

If this apparatus is to be constructed out of material on hand in every laboratory, we may take a chloride of calcium tube for the aspirator (Scheibler), and a large test-tube, or any wide-mouthed bottle, for the regulator, in which case the communication of the single parts is brought about by perforations in the corks.

In case it should be preferred to make use of *Bunsen's* platinum funnels, we can proceed a little different from Bunsen's method, as such an exact fit as needed in high pressure is not wanted in our case. Divide a round piece of moderately thin platinum foil, about $1\frac{1}{2}$ inch in diameter, into two equal halves, and shape them into cones, the centre of the circle forming the apex of the cone. In funnels of less than 60 degrees the sides overlap, in funnels of 60 degrees they meet exactly, but can even then be soldered together in one point about the

middle of the cone by a grain of gold and a little borax. I cut off the point of the cone to create a small opening there, as I also perforate the sides of the cone near its apex with a pin.

Before leaving this subject, I will mention, with a few words, a most simple device which I have frequently used to promote filtration, and which consists of a piece of rubber or glass tubing, about 1 foot long, fastened into the tube of the funnel when the arrangement is ready for use. The internal diameter of this tube should be, *at the most*, $\frac{3}{32}$ of an inch. A tube similar in shape to Weil's filtering tube, but of different dimensions, looks more elegant and meets the objection against bringing the filtered liquid in contact with India rubber. The upper wider part is 3 inches long, the lower narrow part is made of a barometer tube, and of the length first named. This little device meets moderate expectations very well, and will often be found a good help.

For washing out precipitates, on a larger scale, I use large funnels, half filled with coarse glass powder (glass heated to redness, thrown into cold water, powdered and the finest powder sifted off), on the evened surface of which is placed a round piece of filtering paper, in close contact with the sides of the funnel, for the reception of the precipitate. As a receptacle, I use a Woolf's bottle of proper size; the filtering pump has an evacuation-tube of 12 feet length.

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## SOLUTION OF HYDROBROMATE OF QUINIA FOR HYPODERMIC INJECTION.

BY WILLIAM SILVER THOMPSON.

The commercial "bromide of quinia" is not sufficiently soluble to make a concentrated solution for hypodermic use; and having been requested by Prof. William T. Howard, to prepare such a solution, containing four grains in twenty minims, or ninety-six grains in each fluidounce, I, at first, availed myself of the reaction between quinia sulphate and calcium bromide, but not being satisfied with the process, I devised the following, which has since been used with success, and gives a satisfactory result:

Take of Quinia sulphate, . 96 grains.
Distilled water,
Diluted sulphuric acid,
Water of ammonia, and
Hydrobromic acid, of each a sufficient quantity.

Dissolve the quinia sulphate in four fluidounces of distilled water, with sufficient diluted sulphuric acid. Mix one hundred and fifty minims of water of ammonia with four fluidounces of distilled water, add to the solution of quinia, constantly stirring, and transfer the whole to a muslin filter. The solution of ammonium sulphate, which passes through the filter, should be tested, and if the presence of quinia is indicated, add a little more water of ammonia to the whole of the solution and return it to the filter.

After the quinia is drained, wash it with distilled water; transfer the moist magma to a tared capsule and add, gradually, just sufficient hydrobromic acid to dissolve it. Evaporate the solution thus obtained on a water bath until it is reduced to a transparent mass, the weight of the quinia hydrobromate is thus ascertained, while, at the same time, any excess of hydrobromic acid is driven off.

Lastly, dissolve the mass in a sufficient quantity of distilled water, so that each fluid drachm shall contain twelve grains. The resulting solution will measure about one fluidounce.

*Baltimore, Md., June, 1876.*

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## NOTE ON SPIRIT OF NITROUS ETHER.

BY J. U. LLOYD.

The attention of every one connected with the drug trade must frequently have been directed to the various prices of the different spirits of nitrous ether thrown upon the market. Very often it can be purchased for less than the actual cost of the ingredients composing the U. S. P. article.

In September, 1874, I examined several specimens of the commercial article, all of which proved to contain a large amount of water. The specific gravity of four samples were ·890, ·910, ·930 and ·940. The U. S. P. directs it to be ·837.

I believe it is generally understood that the substitution of water for alcohol, in making sweet spirit of nitre, governs the price of the article, and not the proportion of nitrous ether; that the manufacturer who sells spirit of nitre at less than the cost of production for pure, decreases the alcoholic strength of his preparation proportionately, and for every cent of deduction takes out a cent's worth of alcohol and substitutes water in its place. What is the meaning of the terms ʒf.

and 4f. so generally used? The expressions are not recognized by the "Pharmacopœia;" there is no authority upon this subject in any standard work with which I am acquainted. They are merely expressions, denoting that one is more largely adulterated with water than the other. An increase or decrease of etherial strength to any reasonable degree will not materially affect the cost of production, and, as far as I can learn, water in 4f. nitre, and more water in 3f. explains their meaning.

Undoubtedly, manufacturers accommodate themselves to circumstances. A certain profit must be made. The nitre is adulterated in accordance with the price at which it is sold. But, perhaps, spirit of nitrous ether may be adulterated fifty per cent. with water, and not be altered in regard to its etherial strength, as is well known, the distillate is much stronger than necessary, and is directed, by the U. S. P., to be mixed with alcohol to reduce its strength. Some think that water, substituted for alcohol, merely changes the form of the diluent; that alcohol only serves the purpose of a diluent, and water will do as well and be inexpensive. I have no doubt many manufacturers conscientiously believe the therapeutical value of the article is not altered in the least by this subterfuge. Experiments, instituted by myself, with a view of finding if this really is the case, demonstrate, to my satisfaction, that the addition of water causes the spirit to decompose very much faster than is the case where the U. S. P. is adhered to.

Nitrous ether, as is well known, rapidly disintegrates, forming acetic acid, nitric acid and other products. Alcohol exerts a preservative influence over it; water hastens the change. I will not intrude upon the time of the reader by giving a full description of my experiments. I will only say that all the specimens examined, upon the market, marked 4f. and 3f. spirit of nitrous ether, contained water and were strongly acid. Upon making the ether perfectly free from acid, distilling it in an atmosphere of carbonic acid, and diluting it with water and alcohol, in different proportions, I found that decomposition proceeded faster with the specimens containing water. The more water the more rapid the change. (See also Thénard's results, in "Gmelin's Chemistry.")

I believe manufacturers should take the matter in hand, and discountenance the substitution of even the smallest amount of water, and

endeavor to make the preparations upon the market conform to the requirements of the "Pharmacopœia." I have not spoken about the etherial strength of the commercial articles. This I believe to be unnecessary while the stuff is made as it is, for even if the full amount of nitrous ether is present when the article is sold, it will not long remain reliable while in contact with twenty-five or fifty per cent. of water. I do not wish to be understood as saying that every manufacturer is making adulterated spirit of nitre. I believe, however, that one hundred pounds of the adulterated article is sold upon the market to one pound of pure. Let our retail druggists, over the country, test the preparations upon their shelves and judge for themselves, and let us endeavor, in some manner, to reform this disreputable business; for such I must consider it until convinced that the U. S. P. is wrong in directing the specific gravity of spirit of nitrous ether to be ·837.

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## POWDERED DRUGS UNDER THE MICROSCOPE.

BY MARK W. HARRINGTON, M.A.
Assistant Professor of Botany in the University of Michigan.

(*Continued from page* 246.)

### 2. TAPIOCA (Fig. 2).

A starch from the root of *Manihot utilissima*, a poisonous plant of the Spurge family, from South America and the West Indies.

The grains are unusually compound, the two, sometimes three or four, grainlets of which are generally separated from each other in the preparation of the article for market. The grainlets differ considerably with the direction from which they are viewed. From the side, they appear rounded at one end, cut off at the other, and contain an apparently conical cavity, of which the nucleus is the apex and the flat side of the grain the base. Seen from the end, the grains appear circular, with a round, central nucleus. The layers are not distinct, though sometimes one or two can be made out. The diameter of the grains varies from 1*tt.* to 16*tt.*

FIG. 2. Tapioca starch.[1]

The tapioca of the markets is in small, white masses, tough, slightly elastic, odorless, and with a slight taste. The grains of starch are distorted, more or less, by the heat used in the preparation of the article. A careful examination, however, will show many grains of the original form.

[1] Figures 2 and 3 are taken from Vogl's "Nahrungs- und Genussmittel"; the remainder are by Miss Reed.

Several other species of Manihot are said to furnish a part of the tapioca in the trade. Their starch-grains are much like those just described, and, in the present state of our information, it is not practicable to distinguish them.

Tapioca is said to be adulterated with potato, sago and wheat-starch. It is, itself, used as an adulterant of arrowroot.

### 3. SAGO (Fig. 3).

The starch from the stem of several species of palm-trees, generally *Sagus Rumphii*.

The grains are ovate or oval, with the margins sometimes slighlty concave. The rings are evident, and there is a round or star-shaped nucleus nearest the larger end. Many of the grains are singularly compound, consisting of a large grain, with one or more much smaller ones forming protuberances on it. In commercial specimens, the grainlets of the compound grain are usually separated from each other, and show only the flattened surfaces where they were in contact. The length of the grains is from 7*tt*. to 24*tt*., usually above 14*tt*.

FIG. 3. Sago starch.

Granulated sago is made into small, round masses by being passed through a sieve and subjected to heat. The masses are brownish in color. The starch-grains are but little altered by heat.

Pearl sago is in larger, white, spherical masses, which in the course of preparation have been subjected to considerable heat, and afterwards bleached. The grains of starch in this case are swollen and distorted, and the nucleus is bulging.

The principal adulteration of sago is by means of potato starch. From it a false sago is made, which resembles the real article very closely. The microscope will readily show the difference between them. Sago is employed as an adulterant of several other starches.

### 4. ARROWROOT, OR MARANTA (Fig. 4).

The starch from the root-stock of *Maranta arundinacea* and, perhaps, other species of the same genus.

It is a powder, with small scattered, irregular masses, of a dead-

white color, but glistening a little when examined closely, crackling slightly when rubbed, inodorous and insipid.

The grains are simple, egg-shaped, or oblong. The rings are fine and concentric or eccentric. The nucleus is large, shaped like a point, or a slit crossing the grain or two slits crossing each other. It is in the center, or nearer the larger end of the grain. The length of the grains is from 1*tt.* to 24*tt.*

FIG. 4. Maranta.

Other varieties of arrowroot are described, from the European trade, though the writer has never seen them in the United States, with the exception of potato-arrowroot, which is occasionally found. It can be easily distinguished by the examination of the starch-grains already described.

Curcuma arrowroot is known by starch-grains which are rather larger than those of maranta, and which have the nucleus on the margin of the grain, frequently on a projecting point. Canna-arrowroot, or *tous les mois*, consists of starch-grains from 16*tt.* to 50*tt.*, which are therefore about twice as long as the grains of maranta. The larger grains are flat and more or less egg shaped, with the nucleus near the smaller end. The concentric lines are fine, regular and very numerous. Tacca or Tahiti arrowroot consists of grains 4*tt.* to 15*tt.* long, and shaped much like the grains of sago-starch. They are partly convex, partly with flat surfaces, rather hemispherical or pear-shaped. The nucleus is nearly central, and star-shaped. Arum or Portland arrowroot consists of very minute grains, something like those of Tacca, but only 1*tt.* to 8*tt.* in diameter.

The above can be considered in the light of commercial varieties. Fraudulent substitutions or adulterations of maranta with any of the cheaper starches may be expected. Potato, sago and tapioca starches are especially used for this purpose.

### 5. AMYLUM (Fig. 5).

Under this name, the "U. S. Pharmacopœia" calls for wheat-starch,

that is, starch taken from the grain of the cultivated wheat. As a matter of practice, pharmacists usually sell corn-starch under this name. As the latter, when well prepared, is an excellent article, perhaps superior to wheat-starch, there is no objection to this substitution, if it is well understood.

Wheat-starch is in slender, brittle, irregular prisms, or in a powder. It is of a dead-white color, odorless and insipid. Like most starches, when rubbed between the fingers it crackles slightly.

The grains are of two sizes, with but few intermediate. The larger ones are lens-shaped, and present only indistinct traces, if any, of nucleus and rings. When these do appear, the former is central, the latter concentric. They are from 14*tt.* to 16*tt.* in diameter. The smaller grains are spherical, and usually less than 3*tt.* in diameter.

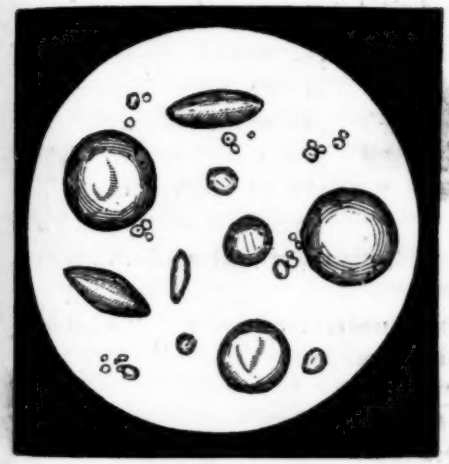

FIG. 5. Wheat starch.

The starch grains of rye and of barley are much like those of wheat, and it is sometimes desirable to distinguish them. In rye, the larger grains are from 16*tt.* to 21*tt.* in diameter, and have frequently a distinct star-shaped nucleus, while the smaller are decidedly smaller than those of wheat. In barley, the larger grains are about 11*tt.* in diameter, with, often, rings and nucleus, while the smaller grains correspond closely to those of wheat.

Wheat starch is a prominent constituent of "Imperial Granum," "Baby's Cereal Food," Ridge's "Cereal Food," and many similar proprietary substances. They are powders of no great complexity, and the determination of their constituents would be excellent practice for the pharmacist inexperienced in this line of his work.

### 6. CORN STARCH (Fig. 6).

This starch is derived from the grain of corn, and comes in a form like that of wheat starch. Its powder, however, is glistening, while that of wheat is dull.

The grains of starch are quite small, not surpassing 12*tt.*, and usually lying between 6 and 9*tt.* They are simple; the general shape is spherical, but the sides are more or less flattened, and the grains misshapen by mutual pressure. In the starch from the central white and mealy part of the kernel of corn, the grains have more flat sides, due to the greater pressure; while in the more hyaline outer part of the kernel, the starch grains are rounder. There are no rings visible. The nucleus is central, and is a round point in the fresh starch grain, star-shape in that which has been dried.

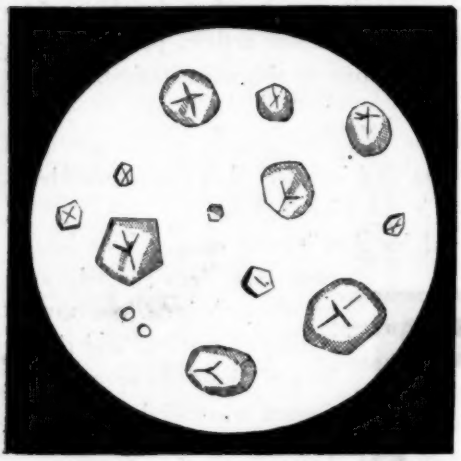

FIG. 6. Corn starch.

Corn starch is extensively sold under the names of "Maizena," "Maizone," as well as that of amylum.

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## ANALYSIS OF FACE LOTIONS.

BY GEORGE JOSEPH MITSCH, PH.G.

(*From an Inaugural Essay.*)

The author selected Hagan's Magnolia Balm and Laird's Bloom of Youth for his analysis. Both are put up in opaque white glass bottles, and consist of a liquid precipitating a white sediment on standing, which is readily suspended again on shaking.

One bottle of Hagan's Magnolia Balm was found to contain 3¼ fluidounces of liquid and 262 grains of insoluble portion. The clear filtrate was not acted upon by either sulphuretted hydrogen, sulphhydrate, carbonate or phosphate of ammonium, and on evaporation left two drachms of a syrupy residue which was proven to be glycerin. The insoluble powder was dissolved in hydrochloric acid with effervescence. The solution was not precipitated by sulphuretted hydrogen, but after having been rendered alkaline by ammonia, with which

it yielded a clear solution, gave a white precipitate with sulphhydrate of ammonium. The precipitate was zinc, and the filtrate, when evaporated and ignited, left no solid residue. Carbonic acid was the only acid found in the powder, which had been colored with ½ grain of carmine. The liquid was flavored with lavender and bergamot.

One bottle of Laird's Bloom of Youth was found to contain 2½ fluidounces of liquid and 212 grains of insoluble powder. Tested in the usual manner, the liquid responded to the tests for small quantities of iron and calcium, and on evaporation left half a fluiddrachm of glycerin. The powder was dissolved in hydrochloric acid, effervescence being produced, and the solution treated with sulphuretted hydrogen, which produced a black precipitate, due to bismuth. The filtrate treated with ammonia and sulphhydrate of ammonium, gave a white precipitate, due to zinc, and the filtrate from it yielded, with ammonium carbonate, a white precipitate, due to calcium.

Besides carbonic acid, the presence of hydrochloric acid was proven in the nitric acid solution by silver nitrate.

A quantitative estimation of the insoluble portion yielded—

| | | |
|---|---|---|
| 31·204 grains of | . . . . | oxychloride of bismuth, |
| 129·792 " " | . . . . . | carbonate of zinc, |
| 50·004 " " | . . . . . | carbonate of calcium. |

Total 211·000 grains; actual weight, 212 grains.

The powder was colored with ¼ grain of carmine, and the liquid was perfumed with lemon and bergamot.

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## AGAVE AMERICANA LIN. AND ITS USES.

BY FRANCIS MARION MURRAY, PH.G.

(*Abstract from an Inaugural Essay.*)

To the curious and interesting plants of the genus Agave, the name *Century plant* was given from the gardener's fable of its requiring one hundred years for them to produce their flowers. That they flower but once in a century is true, since they propagate their species by flowering but once, when they wither and die.

Being indigenous to tropical America, and from the fact that they were for many years confounded with the genus Aloe, the plants of which, when young, may be mistaken for them, they have received the general appellation —*American Aloe.*

The generic name "altered from the Greek, ἀγαυός, wonderful, is not inappropriate as applied to A. Americana" (Gray), or to the A. pulqué, or Mexicana, which has for many centuries been known to the Mexicans as the *Maguey*, or *tree of wonders*.

The term, "Sisal hemp," is more especially applied to the species *Americana*; Sisal, Yucatan being the principal port of exportation for the fibre or hemp prepared from the leaves.

This evergreen multennial of the order Amaryllidaceæ, produces from the crown of a very short cylindrical base a vast cluster of fleshy, stiff, oblong-lanceolate leaves, having short spines on the edges, and terminating in a strong black spine. The leaves are from 3 to 8 and even 10 feet in length, the first being the shortest, from 3 to 7 and even 15 inches in width, and 1 to 4 inches or more thick.

After the growth of the plant has sufficiently advanced and nearly all the leaves have unfolded, there pushes forth from the center, with rapid growth, a gigantic flower-stalk, from 3 to 8 inches in diameter at the base, which, in Florida, reaches the height of from 15 to 30 feet within a few months. When this shoots up, it carries with it the small innermost leaves, which at regular intervals are produced as appressed, lanceolate-pointed bracts. These bracts are from 4 to 6 inches apart on the lower part of the stalk, becoming closer together as it increases in height, until at the extreme top they quite adjoin each other.

The upper third of the stalk is branched, each branch, or arm, being repeatedly divided into three branchlets, the branches becoming gradually shorter above, so that the inflorescence presents the form of a circular pyramid of perfect symmetry, each branchlet bearing a cluster of small, erect liliaceous flowers, of a greenish-yellow color.

A surprising fact is, that the roots of so large a plant should be so few and small, being apparently insufficient to retain it in an upright position. They are cylindrical and wavy, $\frac{1}{8}$ to $\frac{1}{4}$ inch in thickness, 6 to 24 inches long, having a thin, brownish epidermis, under which is a second thin tissue of a deep red color; the rest consisting of a bundle of strong white woody fibres, with little parenchyma. All the roots of a full-grown plant will scarcely weigh 4 ounces.

It is propagated by seeds and suckers, both being produced simultaneously. It is viviparous, the seeds *always* germinating on the plant. The young plant, or "onion," as it is called, frequently grows 4 to 6 inches high before dropping from the parent plant. Mr. E. C. Howe,

of Key West, Florida, informs me that he has counted as many as 2,000 onions on a single plant; the average number is 1,000. The suckers are comparatively few.

The author is of the opinion that the Agaves generally are viviparous, and states that on the island of Key West there are three rather marked varieties. First, the common green American aloe, with but few marginal spines; 2d, the same, with narrower and more spinous leaf; 3d, a very spinous variety, having a broader leaf than either, and a bright silvery-green color. John Ambercrombie, in "A Gardener's Pocket Dictionary," vol. iii, enumerates a variety having a gold-striped leaf. When young, the plants seem to be equally spinous, but in the course of development the spines on the common green variety gradually disappear, until, when the plant has matured, the leaf margins are almost uninterrupted. The other varieties retain their spines.

This august plant flowers in from 2 to 10, 50 or more years, according to climate and soil in which grown, and attention received. Mr. Howe has, by careful culture, caused the flower-stalk to shoot up in two years from the time the young plant dropped from its parent. On Key West Island there is an area of about seven acres covered with A. Americana, growing in soft rock of oölitic formation, covered with a thin layer of recent humus. The plant is uncared for, and flowers in from 5 to 8 years.

It usually requires about 8 months after the flower-stalk makes its first appearance for the plant to attain its full growth, immediately after which it begins to wither and soon dies, stem, leaves and roots.

The author cites from "Amer. Journ. Sc. and A.," 1833, a letter from Henry Perrine, then U. S. Consul at Campeche, and the statement of M. Bazire, with which he concurs, in assuming the species yielding the pulqué of Mexico to be distinct from A. Americana, which grows well in sandy or calcareous soil near the sea level. The differences may, however, to a great extent be due to long-continued cultivation, which may have caused the coarse fibres of the leaves to disappear under the effect of rich soil and genial temperature.

A. Americana is indigenous to the intertropical region of America, and has been introduced into most sub-tropical and warm, temperate climes of the earth. It was brought to Key West by Mr. H. Perrine in 1838, and was then introduced to Indian Key, Cayo Largo and the

main-land, where it grows as far north as lat. 28°. It grows also in Southwestern Texas and Southern New Mexico.

*Uses.*—The growing plant is used for hedges; the dried flower stems constitute a thatch, perfectly impervious to the heaviest rain, and split longitudinally, the stem makes an excellent substitute for a razor-strop. But the most important part of the plant is the fibre of the leaf. This is rather coarse, silky-white, harsher and not quite so strong as manilla, but makes beautiful, clean, glossy cordage. The "yashqui," or prickless (common green) variety is most used for this purpose. The reason why such a comparatively small quantity of this excellent fibre has been thrown into the market, is because of there being, as yet, no ready means of separating the pulp from the fibre.

The rude mode of bruising and steeping the leaves in water, and afterwards beating and shaking the pulpy matter off, is very slow and unsatisfactory. Dr. Mease tells us that in Yucatan it is prepared "by means of two sharp corners, made by hollowing out the ends of a wooden tool like a flat ruler; the fleshy leaves are slit in two or three longitudinal strips, and the pulpy substance being scraped off, the fibrous material appears, which is then shaken loose, tied in a knot, and, when dried in the sun, is put up in bales for exportation." Several machines have been invented for separating the fibre; the most efficient is one by Mr. G. D. Allen, of Key West, but he found much difficulty in ridding the leaf, in an expeditious manner, of a thin epidermis, which adheres closely on both sides. His idea was to express the juice by passing the leaves between steel rollers, ferment the juice for the 10 per cent. of alcohol which it will yield, place the expressed leaf in water for three or four days, dry, shake off the pulp and utilize it for manure, and clean the fibre for cordage. But, being too far from a market, he was compelled to abandon it, after having sustained heavy losses. One stalk, or plant, produces from 75 to 100 leaves fit for cutting, and thirty tons of green leaves make one ton of fibre. The fibre is finer and easier separated before the flowering stalk shoots up. "Great quantities are sent to Cuba to make coffee-bags, and since 1825 numerous cargoes have been imported into the United States, and worked up into hawsers, running-rigging and small ropes" (Dr. Mease). Also, a coarse kind of "thread, twine and hammocks are made from the fibre. The ancient Mexicans made from it a coarse kind of paper, and the Indians use it for oakum." (Chambers' Cyclop.) "The

leaves are employed for scouring pewter, kitchen utensils, floors, etc. In Algravia, when pasture is scarce, they are cut in thin, transverse slices, and fed to cattle" (Rees). On the island of Key West, in very dry season, cattle chew the leaves for thirst. Chickens eat the inner tender leaves with avidity. The juice has a bitter, mucilaginous, somewhat nauseous taste, a turbid green color, and an odor that is truly the "stinkingest of the stinking kind." It passes very rapidly from vinous to acetous fermentation; yeast, raisins, whiskey, etc., have been used with little retentive effect. It seems all that is necessary to make "century plant" cultivation a very lucrative business is something to produce rapid and permanent vinous fermentation. It ferments in about 30 hours after expression. The average amount of juice yielded is 2 ozs. per leaf, which, strained and evaporated to a thick consistence in the sun, may be made into cakes or balls with ashes, and used for washing; they will lather with salt as well as fresh water.

Dr. G. Perin, of the U. S. Army, has found the juice to be an admirable remedy in scurvy, and it is much lauded by Mexican sailors as an antiscorbutic. The pulp, made into an ointment, was recommended by Lenoble as an epispastic, and has been used in veterinary practice as a rubefacient. Laxative, diuretic and emmenagogue properties have been attributed to the juice.

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## CONCENTRATED SOLUTION OF SALICYLIC ACID.

BY C. L. MITCHELL.

(*Read at the Pharmaceutical Meeting, held June 20th.*)

A strong solution of salicylic acid, for convenience in both dispensing and prescribing, has long been a desideratum, and until recently no practical way of overcoming the difficulty has been known.

Salicylic acid itself is very sparingly soluble in cold water, and though readily dissolving by the aid of heat, nearly all separates on cooling. Its alcoholic solution is not adaptable to the purpose—for when diluted with water, the acid immediately separates.

Various methods have been recommended for rendering the acid more soluble, namely: the use of various salts, such as sodium orthophosphate, calcium chloride, ammonium acetate, etc.; and also by dissolving it in glycerin. None of these modes of procedure give a solution which contains more than ½ per cent. salicylic acid. The desideratum

seems to be a concentrated solution which will bear dilution with water to any extent. Recently, a writer in the "Druggists' Circular," has recommended the use of sodium biborate and glycerin in the proportions of 1 part each of salicylic acid and the biborate to 16 parts glycerin. This gives a solution containing about 6 per cent. salicylic acid, and is freely miscible with water in all proportions.

While recently experimenting with this formula, it occurred to the writer that probably a still stronger and more concentrated solution might be obtained by some slight modifications. After several experiments the following formula was adduced:

| | |
|---|---|
| Acid. salicylic. pur., | ℥ij |
| Sodii biborat., | ℥j |
| Glycerinæ, | q. s. |

Mix the acid and borax with f℥iv glycerin, heat gently until dissolved, then add q. s. glycerin to make the measure f℥i. This solution contains 25 per cent. salicylic acid, and can be diluted with either glycerin, alcohol or water to any degree desired.

The advantages of a concentrated solution of this description can scarcely be overestimated, as it affords a very convenient mode of both prescribing and dispensing salicylic acid.

*June 20th*, 1876

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## ON SALICYLIC ACID.

BY CHARLES BECKER.

The addition of the phosphates of ammonium or sodium has been recommended to increase the solubility of salicylic acid in water, but these agents really amount to but very little, as a solvent of 1 part of the acid in three of either phosphate, and fifty parts (by weight) of water throws down a precipitate in less than twenty-four hours. An addition of two parts of sulphite of sodium to one of salicylic acid, in fifty parts of water, precipitates in a few hours. Borax in the proportion of two parts to one of salicylic acid, and fifty of water, precipitates slightly after twenty-four hours; a solution of one part each of salicylic acid and borax, in five parts of glycerin and twenty-five of water, is permanent; while the same proportion of borax, acid and glycerin, in fifty parts of water, will precipitate after twenty-four hours. A solution of one part of acid to two of borax, in twelve parts of glycerin, made with heat, is permanent; but when one part of this solution is

diluted with three parts of water, which makes it two parts of salicylic acid, four of borax, twenty-four of glycerin and ninety of water, a cloudiness appears in a few hours. One part of salicylic acid with one part of water of ammonia (20°) forms with ten parts of water a permanent solution;—this has a light-brownish color, a very faint odor of ammonia, a very distinct, sweet taste of the acid, and a slight acid reaction on litmus paper.

Salicylic acid is soluble in ten times its weight of dilute alcohol, at a temperature of about 80° F., in one and a half times its weight of alcohol (0·835 sp. gr.), and in twice its weight of sulphuric ether It is nearly insoluble in cold oil of turpentine, but hot turpentine dissolves about 5 per cent. of its weight. Its alcoholic solution has a decided acid reaction on litmus paper. An addition of one-fifth of 1 per cent. of salicylic acid to aqueous infusions will preserve them for weeks; and the same proportion added to syrups made with fruit juices, while it will not arrest fermentation after such has set in, will prevent the same.

The acid used in the above experiments was of Schering's make, and perfectly white and inodorous.

When one part of salicylic acid and two parts of olive oil are heated together they form a homogenous mixture, admirably adapted for application to surfaces. The oil will separate to some extent on standing for a time, but agitation will easily combine it again.

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## REMARKS UPON RHUBARB AND RHEUM OFFICINALE.

BY F. A. FLÜCKIGER.

In recent years the French missionaries have gained the advantage of being able to seek for the rhubarb plant in Southeast Thibet, and already in 1863 the apostolic vicar of the district, Monseigneur Chauveau, knew where to procure it. But it was in 1867 that Dabry, the French Consul at Hankow, was first able to forward to the Society of Acclimatization in Paris a living root, which, although it arrived in a very bad condition, was, through the care of the Secretary, Dr. Soubeiran, grown in the garden of the Medical Faculty. The plant was at once recognized by Baillon as belonging to a new species which was described by him in the "Adansonia."[1] After the plant had flowered,

[1] "Adansonia," x (1868), 246. Descriptions appeared in this journal 1872, p. 546, and 1874, p. 154.

the description was supplemented by a figure in the "Proceedings of the Association Française pour l'Avancement des Sciences," for 1871. It was also figured in the "Botanical Magazine," 1874, t. 6135.

In the summer of 1874 the author received roots from the late Mr. Daniel Hanbury, and in 1875 the plant flowered for the first time in Germany in the garden of the Pharmaceutisches Institut of the University of Strassburg, forming a stately, elegant plant. The flower stalk reached its full height about the 25th of May, when the flower, which was at first almost horizontally drooping, appeared. The flower opened on the 27th of May, and on the 9th of June it stood upright, and was in full bloom. In this case it was not, however, as described by Baillon, "pallide virescens," but white. Fruit had appeared on the 20th of June, and by the 26th the flowering had nearly ended and the stalk had attained its greatest height, 2½ metres. Most of the fruit was ripe on the 20th of July, but the quantity in proportion to the number of flowers was small. Professor Flückiger says the flower and fruit of *Rheum officinale* present no characters which distinguish it from other species of *Rheum*.

At the author's request, Mr. Hanbury also distributed the *Rheum officinale* to Messrs. Rufus Usher & Sons, the owners of the large rhubarb plantations at Bodicott, in Oxfordshire, the rhubarb cultivated there being probably *R. Rhaponticum*. Professor Flückiger has now had an opportunity of comparing a root of *R. officinale* grown by himself with one of the gardens of the Paris School of Pharmacy, supplied by Professor Planchon, and one obtained by Messrs. Usher & Sons, and treated and dried in the same way as their rhubarb for the market is usually prepared. After this comparison, Professor Flückiger is able to say that the root of *R. officinale* undoubtedly bears the characters of true Chinese rhubarb, and he thinks that with suitable treatment it would yield a product identical in external appearance.

The first epidermis of the subterranean portion of *R. officinale* is remarkable for a very bright brown-red color; the roots of other species, at any rate those of *R. Rhaponticum* and *R. Emodi*, are only yellowish or yellow-brown. But what still more distinguishes *R. officinale* is the strong development of the root-stock, a large part of which occasionally projects conically from the ground, and is provided with not very numerous secondary roots of the thickness of a finger. Only the root-stock approaches the marbled structure of the true rhubarb; the sec-

ondary roots show the ordinary regular structure of this kind of axis, and no trace of the star-like spots or knots which give the drug its special appearance.

Dr. Schmitz, of Halle,[1] was the first to point out the signification of these knots, and to show that the official rhubarb is a root-stock, which for one year grows as a tuberous, thickened short stem, producing a flower-stalk that dies off completely, and that on this short stem appeared numerous lateral buds that grow in a similar manner to the stem from which they are produced. The knots, however, which Dr. Schmitz looks upon as starting from the medulla, appear, Professor Flückiger thinks, to be related to the vascular bundles of the leaf. In consequence of the close arrangement of the leaves round the root-stock the irregular net-like interwoven fibres stand very close together, so that a tranverse section at the base of the leaf-stalks also give the characteristic circular distribution of the knots. The fibres increase in thickness independently, the inner portion of each separate knot consisting of parenchyma, which behaves as bark tissue, and is surrounded by a cambium ring. Outside the latter the fibre has the character of the woody portion (xylem) to the extent that well perfected vessels appear in it.

The knots are, however, by no means peculiar to the true officinal rhubarb, as they appear also in the so-called European rhubarbs. But there is this very great difference, that they are to be found much more plentifully and in a dense though irregularly arranged zone in the true officinal drug as well as in the root-stock of *Rheum officinale*. But a small number of isolated knots occur not unfrequently in the French or English rhubarbs. This fact led Schmitz to say that the root-stock of *R. Emodi*, Wallich, also possesses the characteristic markings of true Chinese rhubarb, a statement that the author thinks needs limitation. Especially, a remark connected with this, that probably a portion of the Himalaya rhubarb obtained in the country of *R. Emodi*, might be derived from that plant, is, Professor Flückiger thinks, put beyond consideration by the fact that no Himalayan rhubarb occurs in European commerce. After careful consideration of the English and Indian markets, Flückiger and Hanbury felt bound not to perpetuate the name "Himalayan rhubarb" in their "Pharmacographia." Together with innumerable other drugs, probably the roots of *R. Emodi* and other

[1] Session of the Naturforscher Gesellchaft at Halle, Dec. 12, 1874.

nearly allied species which grow in the Himalayas and Thibet, are to be met within the Indian bazaars, and once a couple of chests of such Himalayan rhubarb strayed to England. These, however, as well as authentic pieces of the root which were supplied by Wallich himself, were deficient in the characters of true rhubarb.[1] Practically, therefore, we have no varieties of rhubarb from the Himalayas. The brothers Schlagintweit, in their journey through the western part of the Himalayas, met with *Rheum Emodi*, *R. Moorcroftianum*, Wall., and *R. australe*, Don., but not with the collection or cultivation of true rhubarb.[2]

Similar with respect to the rhubarb of present commerce, opinions are not wanting that it should be considered different from the so-called Russian rhubarb. Thus, Berg is of opinion that this drug, at present disappeared from commerce, should be attributed to another plant which has sometimes been indicated as *R. palmatum*. To the author's knowledge, however, no *Rheum palmatum* cultivated in Europe has yielded roots resembling the true drug. But, in 1872, what appears to be a more nearly allied plant was collected by Przewalski in the highlands of Tangut, near the salt lake of Kokonor, in the province of Kansu (lat. 37° N., long. 100° E.), and described by Maximowicz as *Rheum palmatum*, var. *Tanguticum*. According to the Russian botanist, this plant, which is now cultivated at Erfurt, in Germany, is the plant from which the once preferred Russian rhubarb was derived. Professor Flückiger, however, thinks that a decisive opinion upon the relation of this *Rheum Tanguticum* to *R. palmatum*, at present cultivated in European gardens, on the one hand, and *R. officinale* on the other, is not at present possible; Tangut and Thibet lie so far asunder, that some experience in the propagation of these two plants is desirable.

This uncertainty imparts interest to the notices of the origin and commercial routes of the rhubarb coming into European trade that have accumulated in the course of time. It appears probable that the Chinese, in the thousandth year of their annals, which is earlier than our chronology, employed rhubarb, and that very early caravans went from Central China to Western Asia, to Bokhara, for instance, so that it is possible that rhubarb spread westward in very early times. Acquaintance with it in India in ancient times cannot be determined, inasmuch as the Sanscrit language has no word to describe it. With the ques-

[1] Pereira "Elements Mat. Med., II," part i (1852), p. 492.

[2] "Annales des Sciences Naturelles (Botanique)," vol. vi, p. 334.

tion whether the *Rha pontica*, *Rha coma* or *Rha* of the later Latin writers was the drug of to-day, Professor Flückiger does not deal; but he thinks the expression *Rheum barbarum* or *barbaricum*, first appearing in the sixth century, certainly relates to our drug, and this name appears to have gradually supplanted *Rha ponticum*. Probably it is spoken of in the great geography of China, "Taïthsing-i-thoring-tchi," when it is said that rhubarb, "taï hoäng," a product of the province of Sining-fu [east of the Sea of Koko-nor, already mentioned, in the present province of Kanzu], was admitted into Tangut during the rule of the dynasty of Tang as tribute from the Kouohtcheou district. This dynasty ruled from A.D. 618 till A.D. 905, just at the time when the name *Rha barbarum* was given to the drug in Europe. If there is not here strict evidence of the identity of the Chinese drug, Taï-hoäng, *i. e.*, the great yellow [root], with *Rha barbarum*, the author thinks there is the highest probability.

Esdrisi, the Arab geographer of the middle ages, in his "Geography," written in 1154, and based on oral communications from travelers and the literature of the time, says of a certain district, "It is also there that the Chinese rhubarb grows, and the root is found there in abundance; it is exported to many oriental and occidental countries." The district indicated was the mountains near Buthink, where, according to Esdrisi's account, the nardus (*Nardostachys Jatamansi*, D.C.) also grew, and the musk deer lived. Professor Sprenger refers the notice to the district lying between Hlassa and the Tengri-nor, the great mountain-lake of Northeast Thibet.

"Reubarbe" is found entered among a large number of North Asiatic and Indian products in the customs list of St. Jean d'Acre (1173 to 1183). In a note on Marco Polo's Travels (Leipzig, 1855), Bürk speaks of entire loads which the Dschingiskhan troops met with at the conquest of the town of Lingtscheu (or Lant-scheu-feu), east of Sining in 1227, and which were very acceptable. Wilhelm von Ruysbrock (Rubruquis), who, in 1253 in the service of King Ludwig, reached the court of the Mongol Khan Mangu, found there "reubarba" in frequent use, though he did not reach further than the Karakorum mountains. Twenty years later, the famous traveler Marco Polo pressed much further eastward, and especially among other places to Tangut, to which province so many notices on rhubarb refer it. In speaking of Suctur, the present province of Kanzu, Marco Polo says:

"La grant province general, où ces trois provinces sont, est Tanqut. Et partoutes les montagnes de ces provinces se trouve le reobarbe in grant habondance. Et illec l'achatent les marchans et les portent par le monde." And further, "Ci dict de la cité de Siguy: Siguy est une très noble cité et grande. . . . . Et si y a si grant planté de gent que l'on n'en puet savoir le nombre, . . . . mais ils ne sont point hommes d'armes, ains sont marchans et gens moult soubtilz de tous mestiers. Et si a en ceste cité moult de philosophes et moult de mires [médicins?]. . . . Et es montaignes de ceste cité croist réobarbe et gingembre aussi a grant planté." Professor Flückiger does not think with Pauthier, Marco Polo's editor and commentater, that by Siguy is to be understood Su-tscheu in the province of Kiang-su, but Sining in the western part of the province of Schen-si. The doubt remains, how it was possible that ginger (gingembre) could occur together with rhubarb; but that rhubarb was wanting in the comparatively well-known province of Kiang-su is certain.

As a Venetian, Marco Polo naturally turned his attention to rhubarb. It is known that the Venetians as well as their neighbors the Genoese obtained supplies of Asiatic products not only through the Red Sea and across Egypt, but that their commercial routes from Central Asia found an exit also by the Sea of Azov or the Syrian coasts. In this way, possibly, rhubarb may have been supplied when the Sultan of Egypt interposed difficulties to transmit through his dominions.

During the whole of the middle ages rhubarb does not appear to have been a very important article of commerce. "Rabarbara" occurs in the commercial police regulations of the city of Bruges in 1380, as an import from Italy. In 1445, rhubarb was imported into Dantzic from Riga, and it was one of the valuable drugs which, in 1497, were sought in the first doubling of the Cape of Good Hope. The Portuguese and Italians, who reached India at the commencement of the sixteenth century, obtained from Calicut and Cochin rhubarb that had been imported from China *viâ* Malacca.

Garcia de Orta gives further information respecting the commercial routes which the trade of that time (1563) struck out. It reached Ormuz in the Persian Gulf, made its way through Mesopotamia to Aleppo and thence to Alexandria, where the Venetians took it in hand. Garcia states that rhubarb was supplied direct from Canton to Ormuz.

Like other oriental products, rhubarb appears to have been confined principally to land routes, hence the very high price of the drug. According to Leber, in 1542, a pound of cloves cost 3 livres, pepper 15 sols., but rhubarb 18 livres 15 sols., whilst saffron was only 4 livres 10 sols. In Ulm, in 1596, rhubarb was of higher value than opium.

In the seventeenth century, also, according to a contemporary notice, rhubarb reached Europe by the same different routes "across the Indian Ocean, through the Kingdom of Cascar (Kashgar), through Tartary, Astrachan and through Russia, or to Moscow, and finally through the Kingdom of Thibet, Mogor and Persia."

Holland, Smyrna and Constantinople became emporiums for rhubarb, so that not only Russian or Muscovitic, but also Holland and Turkish rhubarbs were spoken of. Gradually this trade was diverted into other courses. Russia entered into treaties with China, and the commerce between the two great empires was concentrated at the market of Kiachta, in Southern Siberia. The good rhubarb henceforth took its way through Siberia and Russia, whilst only the poorer sorts were brought for export to Canton, the only port in China at that time open. The further changes that the commerce in rhubarb have undergone have been described elsewhere.[1]

Professor Flückiger then proceeds to glance at the more recent notices which have appeared concerning the countries in which rhubarb is collected. The famous description of the Jesuit mission only states that the native country of the principal kind of rhubarb was the province of Se-tschueu (Suitschuan); also the snow mountains from Sue-cheu to Leang-tcheou; and, lastly, Thibet, where, however, only a poorer root was found. Father J. B. der Halde, to whom we owe this information, bases it upon the testimony of eye witnesses, who do not, however, appear to have given any special attention to rhubarb.

More trustworthy information is given in an account of a journey from Pekin to Sz'tshwan (Oct., 1871 to May, 1872) by F. V. Richtofen, who mentions that amongst the products of the province of Sz'tshwan (or Sui-tschuan, at the head of the great Kiang river) the rhubarb grows wild only an the highest hills. The central line of its occurrence runs through the Bayanksra range (southwest of the salt sea of Koko-nor), where the yellow river (Hwangho) takes its rise. From this range the rhubarb extends through the highlands north and south. In the south

[1] "Pharmacographia," pp. 443–445.

it occurs on the hills in the more immediate neighborhood of Kwanhien, but the better sorts begin first ten or twelve days' journey further north.

The principal markets for rhubarb are Sining-fu (just as in Marco Polo's time) in Kansu and Kwanhien in Sz'tshwan. That which comes from the first named place is known as Schensi rhubarb, and obtains the highest price, notwithstanding that the inhabitants of Sz'tshwan are convinced that they produce a better sort. In the western part of the plain of Tshing-tu-fu a kind of rhubarb is cultivated in the fields; but it is far inferior to the wild plant which does not allow of cultivation, and resembles that which is produced in the frontier hills between Sz'tshwan, Hupe and Shensi.

Evidently, therefore, the rhubarb plant is distributed through an immense tract of country in the central provinces of China; it is consequently quite possible that several species yield the same drug.

Von Richthofen's statement that the best sorts are obtained from wild plants is remarkable, as formerly it was generally accepted that the plants were cultivated. The contradiction is probably explained in a letter received by Collin[1] from the missionary Biet in 1871, according to which the rhubarb plant succeeds best, at any rate in Upper Thibet, in the land richly manured by cattle surrounding the mountain huts and stables. The same thing may be said of *Rumex alpinus*, so nearly allied to the species of *Rheum*, in the mountains of Germany, where it grows most luxuriantly in such land, although it is not the subject of special culture.

In 1870, the apostolic vicar Chauveau reported from Thibet that the export of rhubarb from that land had almost ceased, and that nobody cultivated it. It appears, therefore, that the principal seat of the rhubarb production must be considered still to lie in regions mentioned in the middle ages. The natural central point for its export is the city of Hankow in the province of Hupe, on the upper Kiang, or Yan-tse-Kiang. Nevertheless, the yearly export from Hankow to Shanghai does not exceed 250,000 kilos, and it is probable that the general consumption of the drug is falling off.

From the foregoing, Professor Flückiger draws the following conclusions:

[1] "Des Rhubarbes" (Paris, 1871), p. 24.

1. In *Rheum officinale*, we possess for the first time a plant, the root-stock of which agrees with the true rhubarb.

2. This kind grows in Thibet, the northeast district of which probably formerly yielded good rhubarb, but appears to do so no longer.

3. Whether *Rheum officinale* occurs in Sui tschuan, Schensi and Kansu, from which provinces the true rhubarb is obtained, remains to be seen.

4. Also, we require more exact information respecting *R. palmatum*, var. *Tanguticum*. The official rhubarb formerly came from the provinces mentioned under 3, at one time by land, at another through Canton, reaching the sea at Ormuz, Syria, Asia Minor or South Russia, according to existing political relations.

5. Only when China became more accessible, this drug took its natural way to Hankow, the chief market of the Chinese Interior, and from thence to the sea.—*Pharmaceutical Journal and Transactions*, 1876, April 29, from *Neues Repert. f. Phar.*, Jan.

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## SELECTIONS FROM THE DANISH JOURNALS.

BY HANS M. WILDER.

*Nitric Acid.*—It is customary to reject the first thin distillate which will contain the hydrochloric acid present. O. H. Schytt calls attention to the following method which does away with the trouble of changing receiver and watching the distillate; heat, till dry, in a sand-bath (in a porcelain capsule), saltpetre and nitric acid in the proportion of one fluidounce of acid to every five pounds of the salt. Every trace of hydrochloric acid will in this way have been removed, and the distillate from the saltpetre so treated will be pure nitric acid. (The editor remarks that this method has been recommended, among others, by J. Bischoff in his "prakt. Arbeit. im chem. Labor.," 1862).—*Archiv for Pharm.*, 1876, p. 151.

*Extract of Beef.*—Bouchardat warns against the incautious use of this extract, under the mistaken notion that an increase of dose will be followed by a corresponding increase of benefit. Both he and Stuart Cooper have shown that large doses of the extract are quite injurious. He further asserts that it cannot at all be compared to meat-juice (expressed in the cold from raw meat) as a strength giver.—*Ibid.*, p. 160, from *Bull. Thèrap.*, 1875, Nov.

*Phosphorus.*—The solution of phosphorus in alcohol generally takes from 12 to 24 hours, and the alcohol has moreover to be kept warm all the time. It is, therefore, proposed to use glycerin as a solvent. Phosphorus dissolves quite readily by shaking for several minutes with warm glycerin; an addition of warm alcohol will prevent any deposit of phosphorus in cooling.—*Ibid.*, p. 162, from *Apoth. Zeit.*, 1875, No. 35.

*Assay of Cinchona.*—Handry recommends the following as a very quick and sufficiently reliable method: Put into a beaker-glass (or other convenient utensil) 10 grams bark in coarse powder, and 20 grams ammonia water; stir for several minutes, and add 15*ccm.* ether, stir again, let stand till clear and decant the ether into a bottle. The warmth of the hand will be sufficient to evaporate the ether remaining in the mixture. Now repeat the treatment with ether 5 to 6 times, taking care not to add the ether before the remainder of the former has entirely evaporated. The difference in the weight of the beaker, before and after the ether treatment, indicates the amount of quinia.

Cinchonia is estimated by treating this residual bark with chloroform in the same way as above.—*Ibid.*, p. 163, from *J. de Pharm. et de Chim.*, 1876, p. 208.

*Antidote to Strychnia.*—The East Indian physicians recommend nicotia as the surest antidote, which is given in exceedingly small quantities in sherry several times a day. In default of nicotia, a decoction of tobacco leaves ( ½ ounce to a pint) is given.—*Ibid.*, p. 167.

*Adulteration of Arrow Root.*—H. P. Madsen, received some time ago, an original package of arrow root, the appearance of which was all that could be desired, and stood the test of the Danish Pharmacopœia, particularly that with muriatic acid, very well. It did dissolve completely in boiling water, but did not form a thick mucilage even when a very large quantity was dissolved. Examined under the microscope, the arrow root in question presented elliptical grains, about three times larger than those of maranta, and mostly provided with a well-developed hilum, which latter characteristic points to tacca fecula from tacca pennatifida. The grains of canna fecula (from canna coccinea) are of similar shape and size, but the hilum is quite indistinct. The package was consequently returned.

He mentions also having received two packages with damaged arrow root. About the first cask there could not be any doubt, the

musty smell pervaded the whole contents; the second cask, however, presented nothing unusual in the top layer, but the last half of it was found to be musty. Mr. Madsen, therefore, recommends to examine the whole package, and not to be satisfied with a small sample from the top.—*Nij Pharm. Tid.*, 1876, p. 140.

*Pharmacy in Sweden.*—The new poison law dates from January 7th, 1876. The following abstract will give a fair idea of its strict requirements:

*Arsenious acid* must not be manufactured except by special permission, and cannot be imported by other persons than apothecaries and those manufacturers for whom arsenic is a necessity. It can be retailed only by apothecaries, and then only on a *recent* prescription (or order) from a physician, veterinary surgeon or dentist. It may be sold, further, to well-known savants and to other people licensed to its use. It must not, on any account, be sold for poisoning animals, or for conservation of corpses.

The *sworn* assistants (every graduate in Sweden is sworn to his profession, so to speak, before being permitted to serve as such) can only sell arsenic on a prescription; the other sales can only be made by the apothecary himself.

The responsibility is put somewhat curiously: The pharmaceutical assistant and the superintendent of a factory are responsible for any and every transgression; while the apothecary and manufacturer only are responsible in so far as they themselves are parties to it.—*Ibid.*, p. 173.

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## GLEANINGS FROM THE FOREIGN JOURNALS.

BY THE EDITOR.

*Solution of Albuminate of Mercury for Hypodermic Injection.*—Prof. Bamberger dilutes the albumen of hens eggs with 4 times its volume of water, strains through cloth and passes the liquid through a plaited filter. Should the filtrate not be perfectly clear, it is mixed with a few drops of glycerin, well shaken, and after 10 or 12 hours filtered. It is important that an excess of albumen as well as of corrosive sublimate be avoided. To attain this, Dr. Hamberger uses carbonate of sodium as an indicator. To a small portion of the albumen solution, a solution of corrosive sublimate of known strength is gradually added, and a drop of the liquid occasionally tested with the soda solution; the

appearance of a yellowish or reddish color indicates an excess of corrosive sublimate. Sufficient of the albumen solution is now added until the precipitate by carbonate of sodium has a purely white color. The amount of chloride of sodium necessary for affecting a permanent solution is now ascertained by adding sufficient of its aqueous solution until merely a faint cloudiness remains. From the figures thus obtained the necessary proportions are readily calculated. The mixture is set aside for two days, then filtered and kept in small well-corked vials in a cool place. The solution is made to contain 1 per cent. of mercury albuminate, when 20*cc.* will yield 0·171 sulphide of mercury.—*Zeitschr. d. oester. Apoth. Ver.*, 1876, No. 10 and 12.

*Solution of Ammonium Acetate.*—J. C. Thresh purchased seven samples, only two of which were colorless aud had a neutral reaction. They varied in specific gravity between 1·011 and 1·018 and the percentage of ammonium acetate between 4·6 and 7·9.—*Pharm. Jour. and Trans.*, 1876, April 1, p. 781.

*Glycerol of Subacetate of Lead* is recommended by Balmanno Squire as a very useful application in chronic eczema and other skin diseases. It is prepared of the same strength as the liquor plumbi subacetatis, substituting glycerin for the water. The heating is effected in an oil bath, care being taken to keep the temperature a little below the boiling point of glycerin, and when the reaction has been accomplished, the solution is to be filtered while hot, since after cooling it is too viscid to pass through the filter. For use it is diluted with from three to seven times its quantity of glycerin, as occasion requires.—*Phar. Jour. and Trans.*, May 6, p. 881.

C. D. Parry proposes to mix equal measures of liquor plumbi subacetatis and glycerin and to evaporate by gentle heat until the water is driven off.—*Ibid.*, May 27, p. 942.

*Phosphorus Pills.*—Messrs. Allen and Hanburys suggest the following formula as an efficient sustitute for that of the British "Pharmacopœia," which combines the phosphorus with tolu balsam and yellow wax: 2 grains of phosphorus dissolved in sufficient bisulphide of carbon, are mixed with powdered soap and guaiac resin, of each gr. xxxv, glycerin gtt. xii and powdered liquorice root gr. xii or sufficient to make a mass weighing gr. c. The bisulphide evaporates readily, and the mass formed is of good consistence, easily manipulated, readily misci-

ble with other remedies, and what is most important readily soluble.—*Ibid.*, May 20, p. 921.

*Pancreatic Meat Emulsion* has been brought to the notice of the Berlin Apothecaries' Society, by F. Riedel, who obtained from Dr. Rosenthal the following formula for its preparation: 250 grams of finely scraped beef are triturated in a mortar with 25 grams of pancreatic liquid (from the hog) and warm water, until a homogenous, light reddish brown emulsion-like mixture results, which is injected per anum with some pressure, the bowels having been previously cleansed by warm water injection. It is stated that persons have thus been nourished, who for months were unable to swallow or digest food taken in the ordinary way.—*Phar. Zeit.*, No. 18.

*The Preservation of Raw Meat* is effected by A. Herzen by immersing it for 24 or 36 hours in a solution containing 150 boric acid, 30 borax, 15 table salt and 5 saltpetre in 2,000 parts of water. The meat retains its fresh appearance and may afterwards be packed in barrels.—*Chem. Centralbl.*, 1876, No. 15.

*Black Varnish for Leather.*—Hager gives the composition of a commercial article as follows: 30 parts shellac, 2 p. mastic, 1 p. sandarac, 1 p. Venice turpentine, 1 p. castor oil, 145 p. 95 per cent. alcohol and sufficient nigrosin (anilin black).—*Apotheker-Zeit.*, 1876, No. 9.

*Nickelplating.*—W. Baker and J. Unvin use the following composition of the solution: 100 p. nickel sulphate, 53 tartaric acid, 14 caustic soda and 100 parts of water.—*Ber. d. deutsch. chem. Ges.*, 1876, 109.

*The bark of Rhamnus frangula*, which has recently been frequently recommended as a reliable cathartic, has been the subject of a curious observation by Dr. Lamm, of Stockholm. Finding that a bark required double or even treble the usual dose, he ascertained that it had been recently collected, and in comparing it with a bark known to be three or four years old, obtained much better and prompter results with the latter. The inefficacy of the fresh bark may account for the disuse into which *Rhamnus frangula* has occasionally fallen. Fristedt mentions (1873) that the recent bark produces colic and vomiting, and the last edition of the Norwegian "Pharmacopœia." requires the bark to kept for one year before it is used medicinally.—*Zeits. Oesterr. Apoth. Ver.*, 1876, p. 156.

*Hops as a Ferment.*—It is usually assumed that the addition of hops in beer-brewing has the effect or retarding fermentation, in consequence of the precipitation of albuminous substances by its tannin and volatile oil. Sacc, however, believes that hops support fermentation, and that they contain a peculiar ferment of greater fermentative power than beer yeast; this ferment he assumes to be soluble in water, and to be not destroyed by boiling. As a proof of this, he cites the manner in which hops are employed in the United States for the preparation of yeast and in bread-baking.—*Phar. Cent. Halle*, 1876, No. 11.

*Composition of Malt.*—W. G. Valentin reports the following composition of two samples of pale malt:

| | | | |
|---|---|---|---|
| Starch, | | 44·15 | 45·13 |
| Other carbohydrates (60—70 per cent. consist of fermentable sugars), inulin (?Kühnemann's sinistrin), some other bodies soluble in cold water, | | 21·23 | 19·39 |
| Cellular matter, | | 11·57 | 10·09 |
| Fat, | | 1·65 | 1·96 |
| Albuminoids: *a*, sol. in alcohol, sp. gr. ·820, and in cold water, | ·63 | ·46 | |
| *b*, sol. in cold water, and at 68° C. | 3·23 | 3·12 | |
| *c*, insol. in cold, but sol. in water at 68° C., | 2·37 | 1·36 | |
| *d*, insol. at 68—70° C., but sol. in cold water (albumin proper), | ·48 | ·37 | |
| *e*, insol. in cold water, and at 70° C. | 6·38 | 8·49 | |
| | | 13·09 | 13·89 |
| Ash, | | 2·60 | 1·92 |
| Water, | | 5·83 | 7·47 |
| | | 100·12 | 99·76 |

—*Pharm. Jour. and Trans.*, 1876, April 15, p. 826.

*Volumetric estimation of Carbolic Acid.*—Landolt has proposed (*Ber. d. deut. Chem. Ges.*, iv, p. 770) to estimate this acid by precipitating its aqueous solution with bromine water, and weighing the washed and dried tribromophenol which is produced according to the equation: $C_6H_5.OH+6Br.=C_6H_2Br_3.OH+3HBr$. Owing to the volatility of the tribromophenol, W. F. Koppeschaar suggests to make a volumetric determination by adding a known volume of titrated bromine water, which is more than sufficient to change all the phenol present into tribromophenol, and then titrate the excess of bromine in the usual manner by

adding potassium iodide and estimating the iodine by sodic hyposulphite, with starch as the indicator. It is necessary to avoid the loss of bromine by evaporation. Practical results have also been obtained by using, instead of bromine, a mixture of $5NaBr+NaBrO_3$, made by acting with bromine in excess upon caustic soda, evaporating to dryness and mixing well by trituration; if pure, ·751 grams of this mixture are required for ·1 gram of phenol. In using this mixture, hydrochloric acid is added to liberate the bromine, otherwise, the manipulation is essentially the same as before. A mixture of the corresponding potassium salts appears to be less serviceable.—*Phar. Jour. and Trans.*, April 15, p. 821–824.

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## NOTES ON THE INTERNATIONAL EXPOSITION.

BY THE EDITOR.

### II.

At the Paris exposition of 1867, the exhibits of each nation were arranged in spaces radiating from a central building, which was surrounded by several encircling avenues of an oval outline, these avenues separating the various groups of raw and manufactured materials from each other. It was thus possible, by passing along these concentric avenues, to examine all the goods of the same class that were exhibited by the different nations represented, thus affording great facilities for reviewing and comparing the natural resources and industries in any special class, of all the countries exhibiting. This plan, admirable in theory, proved, however, a failure, in so far as many nations could not fill the space allotted for the different groups, either for the entire want or comparative non-importance of the special industries, so that the otherwise unavoidable blanks had to be filled with goods from other groups. Notwithstanding this drawback, the arrangement offered obvious advantages, which, viewed from another standpoint, are counterbalanced by the arrangement of the present exposition, whereby the most important industries can be displayed to the best advantage, and a bird's-eye view obtained of the total productions of each country.

While it must be acknowledged that the general plan of classification, as adopted by the Centennial Commission of the United States, has, in the main, been adhered to also in the arrangement of the special displays, still there are discrepancies, which render the systematic study of any particular branch of industry a matter involving considerable labor, often increased by the long journeys from one building to another distant one, the intercourse, however, being facilitated by a narrow-gauge railroad, with frequently running trains, which convey the visitor to within the immediate neighborhood of all the important buildings. To illustrate the difficulty hinted at, we may briefly mention that the Main Building contains the greater portion of the fixed and essential oils, while very important displays of the same class of goods are also found in the Agricultural Building, where, likewise, liquor-

ice root and liquorice from Italy, a number of indigenous drugs, etc., are observed. These variations in the arrangement are partly due to the prominence assumed by such articles as products of the soil of some of the countries, partly to the fact that many exhibitors have brought forward and displayed in their cases goods belonging to several groups; and, to a considerable extent, they are due to the desire of displaying most effectively the products of one country as an unbroken whole. The latter is particularly noticeable in the exhibits of several British colonies, Egypt, and some other countries, where articles of food form an important portion of the display in their respective departments in the Main Building.

It is not our purpose in these "Notes" to give a list of the exhibitors or enumerate all the objects of interest to the pharmacist and druggist, nor is it the intention of going much into detail, or of attempting to minutely discuss the merits of all. The latter is possible only for the members of the juries of the different classes, who are afforded ample opportunities for closely inspecting, and, if necessary, testing everything which has been entered for competition. Visitors are not permitted to handle the specimens; but we are under obligations to many private exhibitors as well as foreign commissioners for courtesies extended to us. The main object of these "Notes" will be to convey to the readers of the "Journal" a general idea of the main character of the Exhibition, as far as it relates to articles more directly relating to the drug and apothecary business.

In a country like the United States, where proprietary medicines are largely consumed by the public, the almost total absence of these preparations is quite noteworthy. Since the admission of nostrums to the Exposition was wisely prohibited by the Commission, it seems strange that an extensively sold cherry pectoral and other preparations by the same manufacturer should have been permitted to occupy a space here. If we except one or two minor nostrums, and perhaps also the largely represented class of proprietary elixirs, which, in character, are about intermediate between legitimate pharmaceutical preparations and nostrums, we find nothing in the American department to mar the pleasing effect of the exhibits in this line; even the numerous hair dyes and invigorators are noticeable from their almost complete absence. From some of the foreign countries, however, quite a number of such specialties have been sent, yet mostly in such small numbers, and often so unsightly in external appearance, as to attract little notice. To this there are, however, some exceptions, and, to judge from the display of a foreign cherry cordial, it may may be presumed that this nostrum is of some importance in its native country, and there, probably, takes the place of the numerous bitters and tonics which, in this country, furnish the necessary alcohol, in the scarcely disguised garb of medicine, to those who do not consume alcoholic liquids as beverages.

What naturally attracts the prominent attention of the pharmacist and druggist, is the display of drugs, in which, however, some countries are insufficiently represented; others compensate for this shortcoming by exhibiting the medicinal resources to advantage, and in a manner inviting to closer study. We have noticed but few exhibits—one, in the U. S. Department, and one or two in the enclosure of foreign countries, which show commercial drugs from foreign countries without any additional preparation or purification. Alexandria senna, West Indian canella alba and similar articles, in our opinion, show neither the resources nor the industry

of the United States, unless the former were exhibited, for instance, in connection with the fluid extract, or the latter with the volatile oil or oleo-resin prepared from it in this country, the crude being then valuable only as the source of the manufactured article.

The display of drugs indigenous to the United States, is not as extensive as might have been expected; still there are some very creditable collections, and more may perhaps be found in the Agricultural building, where we observed a specimen of the bark of Celastrus scandens, marked Solanum dulcamara, the parties having been undoubtedly misled by the name of *bittersweet*, which is commonly used to designate both drugs. But we shall speak more fully of our indigenous materia medica on a future occasion, and now proceed to the crude drugs of foreign countries and their various products.

The gem of the exhibit of drugs, in our opinion, is found in the enclosure of the Dutch colonies, where the cultivation of the cinchonas is shown in an admirable manner. The introduction of the cinchonas into Java, and subsequently into India and other countries, is now a matter of history which has recorded also the names of those who were active in introducing the plants and observing the most favorable conditions under which the various species are most successfully cultivated. It is well known that the first attempt on a large scale was made in Java in 1856 by Hasskarl, while Pahud was colonial minister in the Netherlands. But it was chiefly after the cultivation was commenced in British India in 1860, and the results of the observations made in the two countries were compared, that the plantations assumed not only large dimensions, but that also the yield and quality of the bark gave promise of undoubted success.

Examining these colonial products, we notice first nine photographs, comprising views of different cinchona plantations in Java, and of a propagating house, where the young plants are nursed until they are fit for being transplanted to the plantation. Another photograph shows a number of workmen engaged in stripping the bark, and the last one the manner in which it is dried and packed. We now turn our attention to the botanical specimens, of which there are eleven distinct varieties, of each a flowering branch and one with developed capsules being fastened upon card board, together with three specimens of bark taken respectively from the branchlets, the larger branches and the trunk. In addition thereto, each variety is accompanied by a card, upon which is fastened a transverse and a longitudinal section of the stem, so that upon the two cards all the characteristics, morphological as well as structural, can be readily studied. There is also of each variety, a log about two feet in length, covered with the bark, and one end cut so as to show a longitudinal and a transverse section of both the wood and bark. Samples of bark of each variety, several being in bales, complete this interesting collection, which is so handsome and complete in itself as to challenge the admiration of all interested in this industry.

The collection embraces eight distinct species of Cinchona, one or two of which are not rich in alkaloids, namely: C. micrantha, *Ruiz and Pavon*, C. Hasskarliana, *Miquel*, C. lancifolia var. discolor *Karsten*, C. officinalis *Lin.*, C. caloptera *Miq.*, C. succirubra *Pavon*, C. calisaya *Wed.* and C. Pahudiana *Howard*. Of the latter species, there is also the variety lanceolata *Miq.*, and calisaya is represented by no

less than three varieties, namely: 1, raised from seed brought by Hasskarl; 2, from seed sent by Schuhkraft, and 3, by Ledger from Bolivia. The branches of the first variety have broadly ovate leaves with a tapering base; those of the second are much narrower and lanceolate, and of the third variety, ovate and lanceolate leaves are presented.

The Javanese exhibition of cinchonas would be incomplete without the display of the cinchona alkaloids, which together with some of their salts, are shown in various stages of purity; likewise the mixed alkaloids of red bark which have been used with good results in the Indian hospitals and Europe (see *Quinetum* in March number, p. 134). These preparations are manufactured in Java, and although they are not of the dazzling whiteness in which we expect to see them here, no doubt can be entertained of their purity, a minute quantity of coloring matter excepted.

Adjoining the Netherlands, we find in the enclosure of Mexico an instructive collection of medicinal plants, sent here by the Sociedad Mexicana de Historia Natural. For the present, we notice more especially a dried specimen of Cinchona Calisaya, including flowers, fruit and bark. Cinchona seeds were distributed in Mexico in 1866 by the Emperor Maximilian, but for several years afterwards the cultivation was not successful (see "Amer. Jour. Phar.," 1870, p. 542). This seems to be different now, if we may be permitted to judge from botanical specimens of the plants and samples of their barks exhibited by Mr. Hugo Fink, of Cordoba, and which were grown by him in the neighborhood of that city. Three species are represented, namely, Cinchona officinalis, *Lin.* (S. condaminea), C. succirubra and C. calisaya. Two botanical specimens (flowering and fruiting branch) are shown of each species, and though in beauty of preparation and preservation they are not equal to the Java specimens, yet, in the absence of the latter, they would be regarded not only as interesting and instructive, but even as beautiful. Specimens of quilled bark accompany each species, and of Cinchona officinalis a section of the trunk, 9 years old, nearly 2 feet long and about 6 inches in diameter is shown, with the bark still adhering.

Passing westward in the Main Building, we meet cinchona barks again in the American department in connection with the displays of Powers & Weightman and of Rosengarten & Sons, where they are shown as the source of quinia and the allied alkaloids exhibited by both firms in large quantities and in a variety of combinations. The barks exhibited by Rosengarten & Sons comprise samples of red, Calisaya, hard Pitaya and cinchona barks, grown in India and Ceylon. Powers & Weightman show original packages and separate samples of Calisaya, red and other South American barks, and samples of their powder; also, East Indian bark from Cinch. succirubra and C. officinalis, the latter partly of the first crop and partly of the *renewed* kind. It will be remembered that in India the bark is partly removed from one side of the tree in such a manner as not to disturb the cambium layer, after which the wound is covered up, when the bark will again be formed, and, after some years, will have attained sufficient thickness to be collected as renewed bark. Treated in this manner, the tree is made to yield several successive crops of bark.

The cinchona alkaloids and their salts form a prominent feature of the exhibits of the two Philadelphia firms mentioned, more particularly the sulphates which are shown in bulk in large quantities; the weight of the quinia sulphate in one glass

case of Powers & Weightman's being 1,003 ounces. Chinoidin is likewise to be found in both places in very considerable quantities.

Among the new or rarer salts exhibited by both firms, may be mentioned the handsomely-crystallized bisulphates of the four cinchona alkaloids, which are more soluble than the sulphates ordinarily employed—the hydrobromates, hydriodates, hydrochlorates, phosphates, acetates, citrates, etc., of one or more cinchona alkaloids. Similar salts of the same alkaloids are likewise shown by Ch. T. White & Co., and amongst them is particularly noticeable a very handsomely-crystallized sample of valerianate of quinia. In this connection it may not be amiss to again call attention to the incorrectness of naming the compounds of alkaloids with hydrobromic acid *bromides*; since in these combinations the hydrogen of HBr is *not* displaced, their correct appellation is *hydrobromates*.

Directly opposite to the chemical exhibits of the United States is the chemical section of the German empire, in which we find compounds of the cinchona alkaloids, exhibited only by Jul. Jobst, of Stuttgart, the other quinia manufacturers being not represented. Besides several of the salts mentioned above, we find here crystalline masses of a compound marked Chininum sulfuricum biacidum (tetrasulphuricum), and which, therefore, appears to be a definite compound of one molecule of quinia and four of sulphuric acid. The results of Jobst and Hesse's observation, mentioned in another place (see page 328), are shown in small samples of phenated muriate and sulphate of quinia, named by them phenylmuriate and phenylsulphate, names which, at least for pharmaceutical purposes, appear to us to be less desirable than the former, because one may be confounded with the sulphophenate (sulphocarbolate) from which it is entirely distinct. Since the new salts liberate carbolic acid very readily under various circumstanees, they may probably be destined to become important remedies. Salicylate of quinia, the only specimen noticed by us, is exhibited by the same firm; also, the handsomely-crystallized compound of quinia with anethol, discovered some years ago by O. Hesse. It has the taste of quinia and anise, and when heated evolves anethol. The conchinin (Hesse's) and its preparations exhibited, are identical with Pasteur's quinidia; but the chinamin is an alkaloid, discovered by O. Hesse in the bark of Cinch. succirubra, cultivated in British India, and the name of which we rendered with *quinamina* ("Amer. Jour. Phar.," 1872, p. 302), when noticing Hesse's original paper. The phenylsulphate of cinchonidia, we suppose, belongs to the same class of compounds noticed above, but we do not remember having met with an account of it.

It will be observed that in this exhibit—notwithstanding the large case and the small bottles by which attention is first attracted to it—we meet the results of very considerable original research.

Some distance to the northwest of the former, and just at the entrance to the exhibits of Jamaica, we observe a stem, 22 feet high, of Cinchona succirubra. We are informed by Mr. Robt. Thomson, Superintendent of the Government Botonical Gardens, at Kingston, Jamaica, and commissioner to this exposition, by whom the very interesting and instructive collection from Jamaica has been very judiciously arranged, and to a considerable extent furnished, that the cultivation of cinchonas was commenced there by the government in 1868, the plantation now consisting of 300 acres, about 40 acres having been planted annually. The

climatal conditions requisite for this culture are found in the Blue mountains, at a height of from 4,000 to 6,000 feet above the sea, where the temperature rarely falls below 50° F. or rises above 70°, and where the necessary humidity is afforded. The first crop of bark is expected to be realized about the tenth year from the time of planting out, as has been the case in the plantations of India. Mr. Thomson exhibits, however, the bark from three trees, seven years old, of which C. Calisaya yielded 3, C. succirubra 4 and C. officinalis 2 lbs. of bark. According to the analyses, made by De Vrij and Howard, some time ago, the last named species does not promise to become rich in alkaloids. Moreover, it does not grow so vigorously as the two preceding species, and, as will be seen above, yields less bark in the same period; for these reasons its cultivation has not been extended for some years past. The two other species, of which the succirubra is the most rapid grower, yielded, to the two quinologists named before, very satisfactory results, so that Jamaica may be expected to produce, in a few years, a steady supply of excellent cinchona bark.

With the above, we have exhausted all the fine specimens of cinchonas and their products. The India department of the exhibition contains, from the India Museum, at London, an excellent collection of articles of Materia Medica from the East Indies, which gives a fair idea of the vast resources of that rich country. In that collection are also samples of Calisaya and red barks from the Neilgherry mountains and Kangra, but the specimens are small and insignificant as compared with those enumerated above, nor has an attempt been made to show the extent and success of the cultivation of cinchonas, as we find it in the departments of Netherlands, Mexico and Jamaica; the chemical section of the United States gives a far better insight into the importance of India in this respect. The other British colonies, into which the cinchonas have been introduced, make, like India, no especial display of these valuable barks, nor has Peru sent any samples of these products of her soil, except a small bottle labeled *cascarilla*, without any other designation, and containing quilled cinchona bark of undetermined origin.

Brazil exhibits a bark, from Matto Grosso, which is labeled *Ginchona cuyabensis*, a name which we do not find in Weddell's "Notes sur les Quinquinas," nor is it stated whether this bark really contains any cinchona alkaloid.

The chemical products of the cinchonas are likewise not as well represented as they deserve to be for their industrial importance alone, even firms being absent whose quinia is sometimes met with on this side of the Atlantic. It is true that small samples of quinia and other alkaloidal salts are to be found scattered in various places of the exposition; but they have the appearance rather of being sent here as products of pharmaceutical skill, than to give an idea of the large industrial pursuits of their countries.

In the above account we have taken no notice of the scale preparations of quinia and iron, of which there are numerous samples, large and small, on exhibition, not only by manufacturers of quinia, but also by other manufacturing chemists, manufacturing pharmacists and manufacturers of specialties. The scales are either red-brown, like the salt officinal in the U. S, or green, like that officinal in the "British Pharmacopœia." All are handsome in appearance.

We have observed only one living specimen of Cinchona in the Horticultural Hall of the exposition; it is C. succirubra, and the little tree is about four feet high.

# VARIETIES.

NEW CRYSTALLISED HYDRATE OF HYDROCHLORIC ACID. By I. Pierre and E. Puchot.—Strong commercial hydrochloric acid may be maintained at a very low temperature without any change; but when into the cooled liquid a continuous current of nearly dry hydrochloric acid gas is passed, an abundant deposition of crystals soon occurs, and at the same time the temperature rises from — 22° to — 18°, remaining stationary at this last point during the formation of the crystals. These crystals decompose rapidly in the air, emitting white fumes; they very quickly dissolve in water at ordinary temperatures, but at — 18° the solution is effected very slowly. Analytical results lead the authors to assign for their composition the formula $HCl.2H_2O$.

They find that mixtures of snow and ordinary hydrochloric acid constitute powerful and economical refrigerants. With 2 parts of snow to 1 part of acid a lowering of the temperature to — 32° is readily obtained.—*Journ. Chem. Soc.*

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INFLUENCE OF VARIOUS SOLUTIONS UPON THE RUSTING OF IRON. By A. Wagner.—Details are given of experiments made upon strips of iron which were acted upon by water containing various salts, in presence of air free from carbon dioxide, and of air containing that gas at various temperatures, and also in sealed tubes, from which air was expelled.

The general results were that pure water in presence of air, causes iron to rust; that if carbon dioxide is also present, the rusting is more rapid; that the production of rust is materially increased by the chlorides of magnesium, ammonium sodium, potassium, barium and calcium, the first mentioned being most active in this respect; that iron immersed in evaporated river-water rusts more slowly than iron in distilled water; that the presence of oils or fats greatly diminishes the rapidity of rusting; that alkalies prevent the rusting entirely Magnesium chloride solution in the absence of air attacked iron at a temperature of about 100°; chlorides of sodium, potassium, barium, and calcium were without action under the same circumstances. The original paper must be consulted for details and measurements. *Journ. Chem. Soc.* [Lond.]

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ON THE ACTIVE CONSTITUENT OF ERGOT OF RYE. By R. Buchheim.—According to the author's experiments, the active constituent of ergot (ergotin) is a body closely resembling animal gelatin. It is easily soluble in cold water, and is, therefore, contained in the cold aqueous infusion of ergot. Like gelatin, it gives precipitates with phenylsulphuric acid, tannic acid, and chlorine. It cannot, however, be completely precipitated by tannic acid. It is formed by the action of the mycelium of a fungus on the gluten of rye, by which action the gluten undergoes a series of transformations, terminating in its conversion into leucin, ammonia, and trimethylamin. The decomposition of gluten under the influence of the fungus is, therefore, analogous to the putrefaction of albumin. In both cases albuminous substances undergo a series of transformations different from that which occurs in the healthy animal organism, and the products formed have, in

consequence, different properties. The end-products, however, are the same in both series. Ergotin, therefore, belongs to the class of putric products, and the author thinks it may be possible to obtain from other sources, as for instance putrid blood, a body having similar properties.—*Jour. Chem. Soc.* [Lond.], from *Arch. Pharm.* [3], vii, 32—39.

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COMBINATION OF PHENOL WITH NEUTRAL QUINIA SALTS.—J. Jobst and O. Hesse obtained white shining prisms on adding an equivalent weight of carbolic acid to a hot aqueous solution of neutral quinia sulphate, or on dissolving the salt in a hot alcoholic solution of carbolic acid (see also "Amer. Jour. Pharm.," 1876, p. 216). The salt is readily soluble in boiling water and alcohol, but requires at 15° C., 680 parts of water and 74 p. of 80 per cent. alcohol for solution. Ether and chloroform dissolve only traces of it, but it is freely soluble in a mixture of 2 vols. chloroform to one of 97 per cent. alcohol. At 100° C. it looses only water of crystallization; at 130° C. (266° F.) some carbolic acid is given off. Analysis proved its composition to be $2(C_{20}H_{24}N_2O_2,SO_3).C_6H_6O+2H_2O$, which formula requires 9·32 $SO_3$, 4·17 $H_2O$ and 75·52 quinia. Salts of similar composition were obtained with hydrobromate and hydrochlorate of quinia.—*Ann. d. Chem.*, clxxx, 248.

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QUACK-NOSTRUMS.—A. Thurmayr, druggist, at Stuttgart, vends a remedy for enuresis nocturna, consisting of two vials, one of which, intended as an embrocation for the regio pubis, is merely expressed oil of almonds. In the other vial, containing the internal remedy, a liquid is furnished, consisting of about six drachms of urine, mixed with an equal quantity of diluted spirit.—*Apoth. Zeit.*, No. 9, from *Industrie Bl.*

Julius Bittner has introduced Schneeberg's consumption herbs, an infallible(?!) cure for consumption, which are composed of Iceland moss 100 parts, althea and liquorice roots, each 20 parts; figs, St. John's bread, pearl barley, Corinthian raisins, althea leaves and flowers, mallow flowers, mullein flowers, ground ivy, liverwort, colt's foot leaves, lungwort (Pulmonaria) and red poppy petals, of each 5 parts.—*Ibid.*, No. 12.

Lebert's American vegetable hair restorative is, according to J. I. E. Popp, a mixture of 2 grams milk of sulphur, 4½ grams sugar of lead, 25 grams glycerin and 140 grams perfumed water.—*Pharm. Zeit.*, No. 14.

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LAROCHE'S FERRUGINOUS CINCHONA WINE has been examined by Wittstein, and found to contain neither quinia, cinchonia or iron; it is merely an alcoholic tincture of orange berries, sweetened with sugar.—*Arch. d. Pharm.*, 1876, April, p. 339.

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ANISE EARTH is the name given to a gray clay which occurs in the neighborhood of Wischau and Rausnitz, in Moravia, and is formed into small roundish granules by the action of earthworms. In the same neighborhood anise is extensively cultivated, and this granular clay is used by the dealers to adulterate the anise fruit to the extent of 20 per cent. The collectors of this *anise earth* receive about one

guilder (nearly 50 cents) for the hundred weight; the earth is also exported to a considerable extent for the same purpose. By dropping a pinch of the suspected anise upon white paper, from the height of about twelve inches, the adulteration is readily detected, and its amount may be approximately ascertained by picking out the fruit.—*Apoth. Zeitung*, No. 20.

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VANILLIN FROM EUGENOL.—E. Erlenmeyer announces that on treating eugenol-potassium with potassium permanganate (and it seems as if the same result was obtained with potassa alone), vanillin may be obtained. During the action a crystallizable polymer of eugenol is formed. After the completion of his researches, the author will report the results in detail.—*Ber. d. Chem. Ges*, 1876, 273.

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EUCALYPTUS GLOBULUS.—P. A. Hartzer has obtained the following principles, from old leaves: an acid resin yielding, with sulphuric acid, a copulated acid of a handsome carmine color, becoming violet on the addition of ether; two resins, which are not colored red by sulphuric acid; a new fatty acid, crystallizing in fine needles, the sodium and potassium salts of which are soluble in ether; cerylic or a similar alcohol and tannin. The latter yields a red deliquescent crystalline salt on treating the etherial solution of the alcoholic extract with a solution of potassa in absolute alcohol.—*Ibid.*, 314–316.

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PITTAKAL, which was discovered by Reichenbach, 40 years ago, but has not been observed since, has been recently obtained by Grätzel, from the fractions of wood tar having a high boiling point. Liebermann separated from it orange-colored needles, which he names *eupitton*. They dissolve in alcohol and acetic acid with a brown, in ammonia with a blue and in alkalies with a purple color; carbonic acid, or the addition of saline solutions causes blue precipitates which are soluble in pure water, the precipitates by calcium, magnesium, barium and tinsalts usually having a beautiful gold lustre. The lead precipitate dissolves in concentrated sulphuric acid with a red color, which changes to blue on warming.—*Ibid*, 334–337.

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NAPHTHALIN FROM OIL OF TURPENTINE.—By passing oil of turpentine through a red-hot tube, G. Schultz observed that much carbon was separated, and hydrogen evolved, the distillate containing several hydro-carbons. On redistilling the product, the portion obtained between 230 and 232° C. congealed, and, after filtering and pressing, between bibulous paper, yielded naphthalin, which crystallized from alcohol, fused at 30° C. (176° F.), boiled at 217° C. (422·6° F.) and furnished with picric acid, a compound crystallizing in yellow needles and fusing at 149° C. (300·2° F.).—*Ber. d. Deutsch. Chem. Ges.*, 1876, p. 548.

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A NEW GLUCOSIDE IN THE FLOWERS OF CICHORIUM INTYBUS has been discovered by Dr. R. Nietzki. The flowers were extrated with boiling 60 per cent. alcohol the alcohol evaporated in the presence of water, the filtrate slightly acidulated with acetic acid, and precipitated by acetate of lead. The clear filtrate was treated with sulphuretted hydrogen, and then evaporated to a thin syrup, from which the body crys-

tallized on standing; it was washed with cold water and repeatedly crystallized from hot water, when it formed white stellate needles, which were insoluble in ether, freely soluble in hot water and alcohol, also with a golden yellow color in caustic and carbonated alkalies. The warm solution had a very bitter taste. Boiled with a dilute acid, sugar is produced, and a sparingly soluble crystalline body.—*Arch. d. Pharm.*, April 327–337.

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SALICYLATE OF SODIUM, when treated in aqueous solution with carbonic acid, is decomposed, yielding free salicylic acid. Since carbonic acid is continually formed by the various tissues, the blood, notwithstanding its alkalinity, contains a certain quantity of carbonic acid in the free or continually dissociating condition, and for these reasons, Prof. Binz believes that salicylates are not without action when taken internally. This view is strengthened by the antiseptic action, observed in liquids capable of putrefaction, urine for instance, when mixed with salicylate of sodium and carbonic acid.—*N. Repert.*, 1876, 205–210.

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# MINUTES OF THE COLLEGE.

PHILADELPHIA, June 26th, 1876.

A stated meeting of the Philadelphia College of Pharmacy was held this day at the College Hall, No. 145 North Tenth Street.

In the absence of the President, Professor John M. Maisch was called to the chair. Sixteen members present.

The minutes of the annual meeting were read, amended, and adopted.

The minutes of the Board of Trustees for the last three months were read by the Secretary of the Board, and on motion approved.

Wm. C. Bakes read a letter from Professor de Luca, of Naples, donating to the College, with an order for the goods, some specimens of Chemicals, which are now on exhibition at the International Exposition.

Also a letter from Mr. Bosisto, President of the Pharmaceutical Association of Victoria, Australia, donating several specimens of drugs, including a number of products from the various species of Eucalyptus, also on exhibition at the Centennial.

On motion, the Corresponding Secretary was directed to acknowledge the receipt of the letters, and to convey to both the gentlemen the thanks of the College for their respective valuable donations to the Cabinet.

Professor Maisch stated that on the 11th of July he would attend the International Exposition at the request of some members of the Botanical Class, to explain to them such drugs, chemicals and Botanical specimens as were there exhibited. He embraced this opportunity to extend an invitation to all students feeling an interest in the matter to be present at the time appointed.

This being the time for an election for delegates to attend the meeting of the American Pharmaceutical Association in September next, and also for delegates to

attend the Conference of Pharmaceutical Colleges, an election was ordered. Edward C. Jones and E. M. Boring acting as tellers, reported the following gentlemen elected as delegates to the American Pharmaceutical Association, viz.:

Charles Bullock, Peter Williamson, Thos. S. Wiegand, Samuel F. Troth, Wm. J. Jenks.

Delegates to the Pharmaceutical Conference: Professors Robert Bridges, John M. Maisch, Joseph P. Remington. Then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

# MINUTES OF THE PHARMACEUTICAL MEETING.

A meeting for social and scientific purposes in continuance of the regular pharmaceutical meetings was held June 20th, 1876, James T. Shinn in the chair. The minutes of the previous meeting were read and approved. Strangers present were invited to participate.

Prof. Maisch donated to the library "Ricerche sperimentali sulla Solfatara di Pozzuoli, per S. Luca" and ten other pamphlets by the same author, which were sent by him with the specimens donated to the cabinet.

From J. U. Lloyd a specimen of a yellow neutral crystallized principle obtained from the root of *Eupatorium Purpureum*. It is quite soluble in hot, slightly so in cold alcohol, and insoluble in water; does not unite with dilute acids, is decomposed by strong sulphuric acid, is tasteless and as far as known has no medicinal value.

Wallace Procter presented a specimen of oil of peppermint, 54 years old.

Prof. Maisch read a paper, by Charles L. Mitchell, on a concentrated solution of salicylic acid. (See page 305.)

J. T. Shinn observed when a solution was made with equal parts of borax and salicylic acid, the taste was very bitter, when, however, two parts of borax were used this was not the case.

Prof. Maisch believed if the estimate of Prof. Kolbe and others as to the virtues of salicylic acid are to be of value to physicians, they must use it in the free state as this is the only way in which it is effective; if salts are employed to effect a more ready solution, some chemical change is most probably the result. (See also p. 330.)

E. M. Boring had in common with many others, had trouble with prescriptions for this acid from physicians laboring under the error in regard to its solubility and the probable changes produced by the use of chemical solvents. Quite recently water of ammonia had been used to effect the solution of a large quantity of the acid in water; this was only another instance in which the elegant pharmacist gave the conscientious dispenser a great amount of trouble. He also exhibited honey which had been obtained by himself from the comb, exposed to direct sunlight; it became candied in a short time, whereas a portion of the same lot in diffused light had undergone no change. He had also examined a sample of yellow wax which had the concave surface said to be characteristic of adulteration with paraffin, yet upon testing with sulphuric acid failed to find any.

Prof. Maisch exhibited a small branch of a plant from Oregon, probably a Tetranthera, nat. ord. Lauraceæ, with a pellucid punctate leaf, having an aromatic ordor,

and at first pleasant, but afterwards very pungent to the taste, which seems to indicate that it may possess medicinal properties.

Dr. Pile said that he had made dilute phosphoric acid by the second process of Prof. Markoe, and succeeded very well, the summer temperature being favorable, and little attention being required. Other members had found it necessary to operate at a somewhat higher temperature than had been indicated by Prof. Markoe. Dr. Pile also stated that he found written upon a prescription—"examined and found correct," and supposed this an additional method of indicating the correctness of an unusual dose.

J. T. Shinn exhibited thick filtering paper, well suited for rapidly filtering oils or syrupy liquids without being liable to break; it is sold at 50 cents a pound. Several members gave valuable hints in regard to filtration, and Prof. Maisch hoped more attention would be given to some of the devices for rapid filtration which had been illustrated in the JOURNAL. For filtering large quantities of liquids, where evaporation is not detrimental, Dr. Pile lays the paper flat upon a muslin support, stretched upon a frame, and thus obviates all liability to break.

Several members, having given careful study to the Exposition, contributed to the interest of the meeting by calling attention to many drugs and chemicals which are worthy of notice.

On motion, adjourned to meet on July 18th, 1876.

WILLIAM MCINTYRE, *Registrar.*

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# AMERICAN PHARMACEUTICAL ASSOCIATION.

The Twenty-fourth Annual Meeting of the American Pharmaceutical Association will be holden in the Hall of the Philadelphia College of Pharmacy, 145 N. Tenth Street, in the City of Philadelphia, on Tuesday, September 12th, 1876, at 3 o'clock P. M.

Ample arrangements are being made by the Local Secretary, in connection with the friends of the Association in Philadelphia, for the comfort and social enjoyment of the visiting members.

It is important that the meeting of 1876 shall fairly represent the most advanced results obtained in the art and science of pharmacy during the past year, and, therefore, the several "standing" and "special committees" should be ready with their reports, and the members who have answers to Queries, and those who propose to read volunteer papers should see to it, that their investigations are finished in time for presentation of the results at the meeting.

Chairmen of standing committees are reminded of the provision contained in Article x, Chapter vi, of the by-laws, by which they are required to furnish a copy of their respective reports, together with a synopsis of the same to the Chairman of the Committee on Papers and Queries, Mr. William Saunders, of London, Ontario. All persons writing papers for the Association must likewise report to the same chairman, previous to the third session (*vide* Article viii, Chapter vi, of the by-laws).

To expedite the business of the Association, it is earnestly requested that all such papers, with synopsis of the same, be placed in charge of the above named chairman, before the opening of the first session.

It will greatly aid the Secretary and Treasurer if members will see that the applications of those whom they propose for membership are properly made out and signed, and placed in the hands of the Chairman of the Executive Committee in time to be acted upon at the first session.

The admission fee and the annual contribution ($5.00 each,) should accompany the applications, in order to place the names on the roll (*vide* Article iii, Chapter vii, of the by-laws).

In answer to the invitation of the Association, it is expected that the meeting will be honored by the presence of delegates from European Pharmaceutical Associations; this will be an important feature of the meeting, which, together with the great attraction of the Centennial Exposition, and the many objects of interest in and about Philadelphia, cannot fail to render a visit to that city an occasion replete with instruction and with social and intellectual pleasure.

Details with regard to the meeting, and the local arrangements for the reception of the Association, will be given in the circular of the Permanent Secretary, Prof. John M. Maisch, 145 N. Tenth Street, Philadelphia.

GEORGE F. H. MARKOE, *President.*

*Boston, June, 1876.*

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# PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

AMERICAN PHARMACEUTICAL ASSOCIATION.—Most of the Colleges and Associations have informed the Permanent Secretary of the appointment of committees whose object it will be to give to visiting pharmaceutists such information as may be desirable to facilitate the object of their visit to this country. A number of pharmacists from foreign countries have already been visiting the International Exposition, and, after extending their trips to various sections of the country, have returned to their homes. Others will doubtless follow as the season advances, and, once this side of the Atlantic, will be desirous of seeing as much as possible of the new world. They may rest assured that fraternal courtesies will be extended to them everywhere.

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NATIONAL COLLEGE OF PHARMACY, WASHINGTON, D. C.—The regular monthly meeting of the Board of Trustees of the National College of Pharmacy was held June 13th, Mr. R. B. Ferguson, President, in the chair, J. C. Fill, Secretary.

The Committee on the Progress of Pharmacy, through Mr. Chas. Becker, made a very interesting report, embracing many recent discoveries in pharmacy and chemistry. The committee recommend that conversational pharmaceutical meetings be held at 8 o'clock P.M. on the second Wednesday in each month, the object being to discuss more thoroughly the reports of the committee, to secure an interchange

of opinion as to the value of new remedies and pharmaceutical appliances, and to read original papers upon subjects germain to the objects of the College. The report embraced also a synopsis of pharmaceutical and chemical journals in this country and Europe.

The recommendations were adopted.

Mr. Becker also read a very able paper on salicylic acid. (See page 306.)

The Committee on Weights and Measures recommended that Congress be petitioned to require the use of the metrical system in Government departments.

Letters were read from Profs. E. T. Fristoe, A. M. Read and R. Oldberg, accepting the chairs of Chemistry, Pharmacy, Materia Medica and Botany, to which they were elected at a previous meeting.

A copy (2 vols.) of the "Medical Statistics of the Provost Marshal-General's Bureau" was received from Dr. J. H. Baxter. The Secretary was directed to acknowledge the same, and express the thanks of the College.

# EDITORIAL DEPARTMENT.

SOLUBILITY OF READY-MADE PILLS.—The March and April numbers of this journal contained several papers on this subject, in which the relative merits of pills made in the usual manner with an excipient, or subsequently sugar-coated or made by compression have been discussed. Since then we have received a paper from Mr. R. V. Mattison, who is a manufacturer of gelatin-coated pills, and speaks a word in favor of these specialties. We consider it inexpedient to print the entire paper, since it rehearses portions of the former ones, and shall therefore give a brief abstract of his arguments.

Mr. Mattison first objects to the expression of "gelatin-coated or more properly speaking, *glue*-coated," used by one of the writers; admitting that practically one is merely a refined form of the other, he asks: "Was it necessary to appeal to the prejudices of the readers, and is there not commercially such a thing as glue, and also such an article as gelatin?" The proper pharmaceutical association of the terms, he regards as widely different. Admitting that the gelatin-coated pills "swell up," he contends that thereby jelly is formed, which in the natural course of digestion is readily disintegrated. As a simple means of testing the solubility of these and other kinds of pills, Mr. Mattison suggests to place them upon the tongue, and moisten them with saliva, imitating as far as possible the action of the stomach; manipulating in this manner with sixteen varieties of pills, he found the average duration of time that the gelatin coating was in dissolving, to be seventy-five seconds, the shortest being fifty-five and the longest time ninety seconds, when the pills were removed from the mouth owing to the disagreeable taste developed.

Our readers may repeat the experiments by the several methods suggested, and in doing so, the different pills should be placed under precisely similar conditions. In our opinion, *rapidity* of solution is attainable with pills only, when all the material composing them is freely and readily soluble; in the majority of cases, when a rapid action is desired, the physician will have to prescribe the medicine in the form

of solution which is not precipitated by the aqueous liquids of the stomach. In judging of the activity of pills, their solid condition should never be lost sight of, and the materials, more particularly the excipients and coatings, if any, should be such only which in the presence of aqueous liquids are *easily* dissolved, if the quickest activity attainable with pills, is desired. Dry gum acacia is *freely*, but not *readily* soluble in water, even with such a "churning" motion as is attributed to the stomach, and pills made with it are known to have become so hard and practically insoluble, as to pass through the intestinal canal, without having been affected to any great degree; yet such pills (of quinia, &c.), when moistened with saliva and moved about upon the tongue, will in a short time develop a bitter taste.

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SWEET GUM.—Some weeks ago, Louis Hughes, Ph. G., has sent us from Dyersburg, Tenn., specimens of branches, fruit and exudation of Liquidambar styraciflua, accompanied by the following information, concerning the tree and balsam or sweet-gum.

"The sweet-gum tree is abundant here, and is found in the Bottoms and highlands. In the bottoms it is quite large, from 30 to 50 feet high, with rather few and short branches; in the highlands, it is lower and more spreading. Its appearance is different from what we recogize as the gum-tree in the Middle and Southwestern States. The wing-like ridges of cork are generally found on the bark of the small branches of the lower limbs, and more fully developed in trees growing in the lowlands. The "gum" exudes through cracks in the bark, and wounds in the trunk, during all seasons of the year, and hardens on exposure to the air. I have found it soluble in Alcohol and have made a very nice syrup of it, very much like, and almost as pleasant as Tolu. The "gum" is much esteemed by the resident children for chewing, but they select that which is rather hard. During the last three months, our house has been shipping upwards of 100 pounds per month to a Chewing Gum Manufactory, and it makes a very pleasant article."

For further information on "sweet-gum," the reader is referred to an essay by W. L. Harrison, in "Am. Journ. Pharm.," 1874, p. 161; and to various other papers published prior to that.

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# REVIEWS AND BIBLIOGRAPHICAL NOTICES.

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*Microphotographs in Histology, Normal and Pathological.*—By Carl Seiler, M.D., in conjunction with J. Gibbons Hunt, M.D., and Joseph G. Richardson, M.D. Philadelphia: J. H. Coates & Co. 4to. Monthly numbers. Price, 60 cents each, or $6 per year.

The object of this publication is, on the one hand, to replace the microscope, as far as possible, for those physicians who have neither opportunity nor leisure to make such observations for themselves, and, on the other hand, to furnish microscopists, for comparison, correct representations of typical specimens in the domain of normal and pathological histology. The editors are well known in the medical pro-

fession for their labors in microscopy, and *à priori* it might be expected that only good, reliable and typical specimens will be furnished. The photographs are prepared by Dr. Seiler; the plan of the work and the selection of the specimens is principally due to Drs. Hunt and Richardson, under whose supervision the descriptive and explanatory text is prepared. For the present it is purposed to give in each monthly issue pictures of at least one pathological and three normal specimens, to illustrate the differences between healthy and diseased structures. The various plates of the first two numbers, which are now before us, are admirably executed and elegantly printed; the descriptive text is clear and concise, and free from theoretical speculations. The publication, in our opinion, meets the highest expectations, and deserves to be in the hands of every physician, who does not want to be left behind in his profession.

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*Annual Report of the College of Pharmacy of the city of New York, 46th Session; and Fifth Annual Report of the Alumni Association*, 1876, 8vo, pp. 90.

The pamphlet contains the reports of the officers of the college, and of the board of pharmacy, lists of officers and members of the college and of the association, commencement exercises, with the valedictory and other addresses, minutes of the business and pharmaceutical meetings, and several papers read at the latter.

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*Centennial Newspaper Exhibition*, 1876. New York: Compiled by Geo. P. Rowell & Co. 8vo, pp. 300.

The enterprising firm of G. P. Rowell & Co. have undertaken a newspaper exhibition at the Centennial Eposition Grounds. Through the liberality of a number of proprietors of prominent newspapers, funds were secured to erect a handsome pavilion for the accommodation of all periodical publications of this country. The exhibition is quite interesting, and well worthy a visit. The catalogue, whose title we give above, gives a great deal of information which is of interest to readers and advertisers, also sketches of the career of a number of prominent papers.

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## OBITUARY.

Prof. Henry Buignet died in Paris, May 9th, aged sixty years. The deceased was born at Chelles, and soon after passing, in 1840, the examinations, as "pharmacien of the first class," purchased the store founded by Planche, and followed the apothecary business for several years, without, however, losing sight of scientific pursuits. In 1850, he became connected with the "Journal de Pharmacie et de Chimie," as one of its editors; in 1855 he was elected general secretary of the Pharmaceutical Society of Paris, and in 1860 he received the degree of doctor in sciences, having presented a thesis containing important original researches on the nature, origin and transformation of sugar in acidulous fruits. Since 1842 he had been attached to the Paris School of Pharmacy as lecturer (professeur agrégé), since 1861 as assistant professor, and since 1866 as professor of physics; two years later he became a member of the Academy of Medicine, and in 1871 of the Council of Public Hygiene and Salubrity. The majority of his essays relate to the physics of chemistry; of his chemical investigations, conducted either alone or conjointly with Bussy, we may mention those on the composition of manna, on the influence of heat upon ferric salts, on the preparation, preservation and estimation of hydrocyanic acid, etc.